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Vol. 960 Number 4

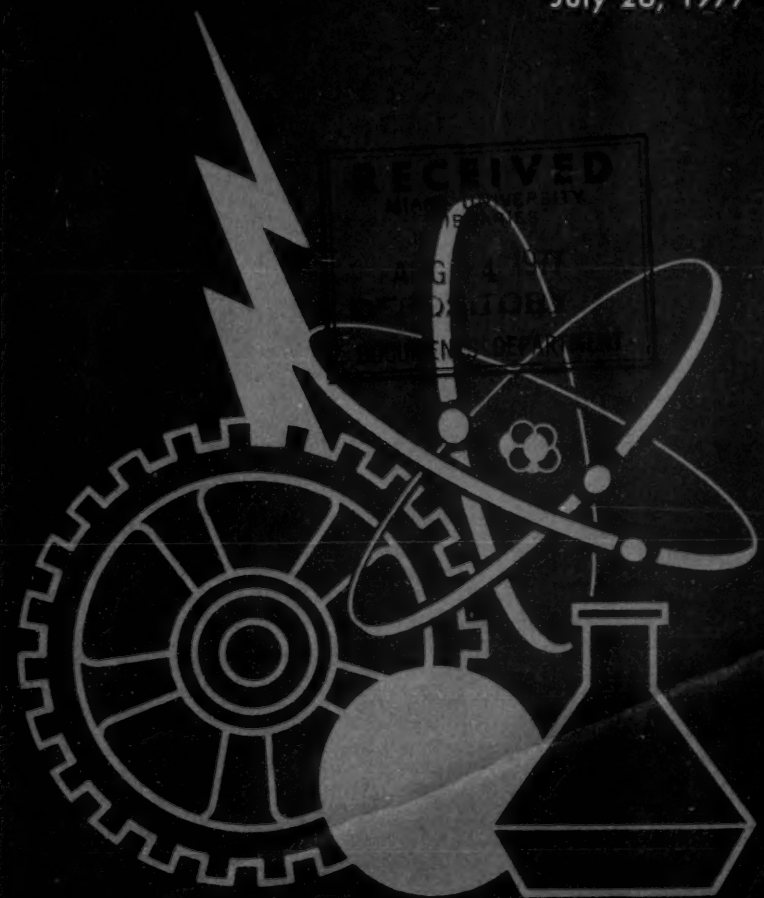
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 26, 1977



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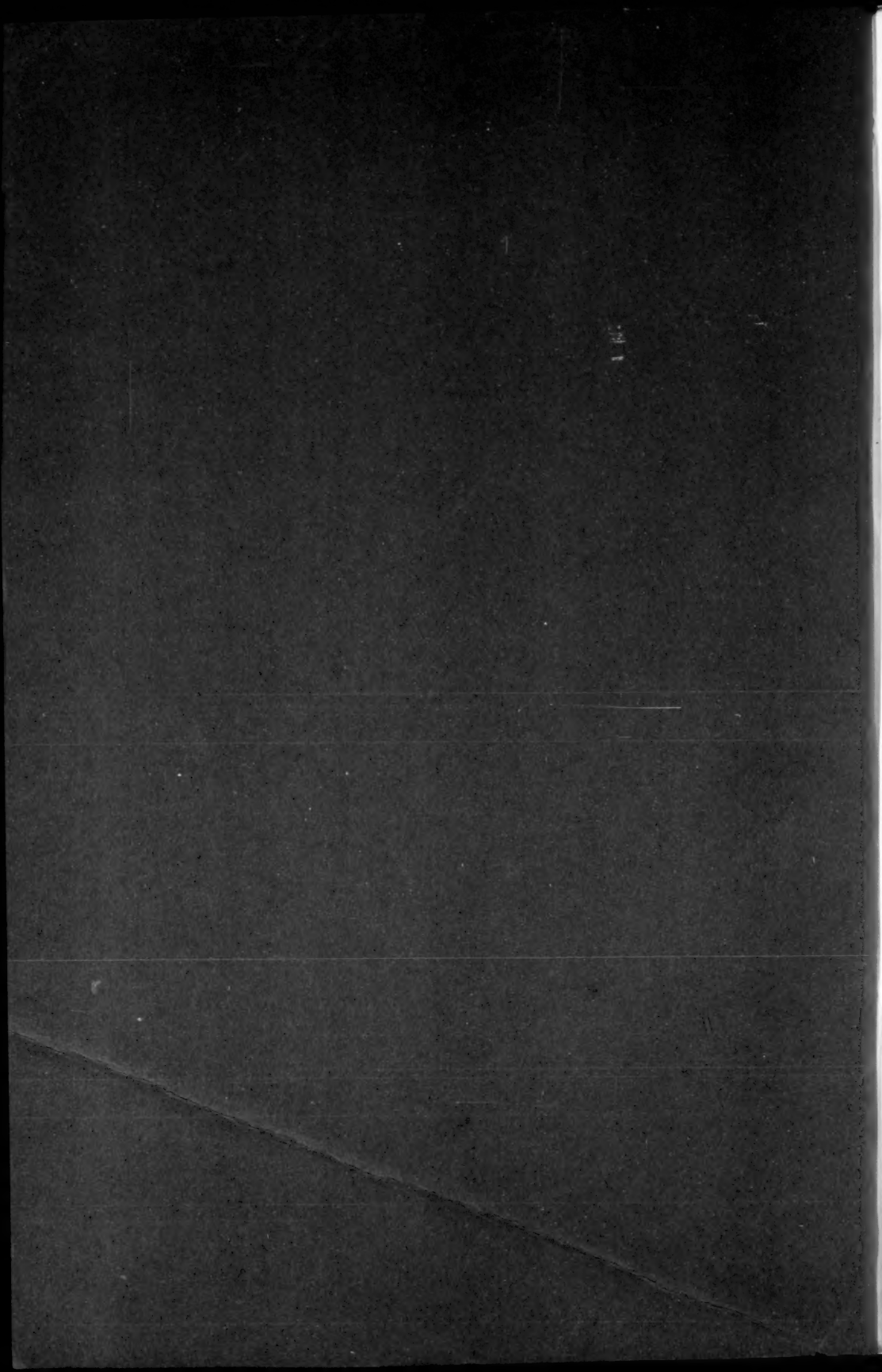

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 26, 1977 Volume 960 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,663,369, Re. S.N. 796,046, Filed May 17, 1977, Cl. 195/31, HYDROLYSIS OF STARCH, Alpha L. Morehouse, et al., Owner of Record: *Grain Processing Corporation, Muscatine, Iowa,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 172

3,844,361, Re. S.N. 803,601, Filed June 6, 1977, Cl. 175/66, CLOSED CIRCUIT METHOD OF CIRCULATING A SUBSTANTIALLY SOLID FREE DRILLING FLUID, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 354

3,852,201, Re. S.N. 803,604, Filed June 6, 1977, Cl. 252/8.5 A, CLAY FREE AQUEOUS DRILLING FLUID, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 223

3,889,067, Re. S.N. 802,735, Filed June 2, 1977, Cl. 179/18 J, DIGITAL TELEPHONE SWITCHING SYSTEM, Irving S. Reed, et al., Owner of Record: *Technology Service Corporation, Santa Monica, Calif.,* Attorney or Agent: Antonio M. Fernandez, et al., Ex. Gp.: 232

3,941,871, Re. S.N. 801,944, Filed May 31, 1977, Cl. 423/326, CRYSTALLINE SILICATES AND METHOD OF PREPARING THE SAME, Francis G. Dwyer, et al., Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 113

3,953,335, Re. S.N. 803,602, Filed June 6, 1977, Cl. 252/8.5 A, MAGNESIA STABILIZED ADDITIVES FOR NON-CLAY WELLBORE FLUIDS, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 223

3,961,446, Re. S.N. 801,811, Filed May 31, 1977, Cl. 47/38, BALANCED BOTANICAL GROWTH CONTAINER, Stanley I. Mason, Jr., et al., Owner of Record: *Simco, Inc., Weston, Conn.,* Attorney or Agent: Haynes N. Johnson, et al., Ex. Gp.: 337

3,994,825, Re. S.N. 801,628, Filed May 31, 1977, Cl. 252/309, PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLYHYDROXY ALCOHOLS, Charles Edward Crompton, et al., Owner of Record: *Chemetron Corporation, Chicago, Ill.,* Attorney or Agent: Nicholas M. Esser, et al., Ex. Gp.: 223

4,015,100, Re. S.N. 804,981, Filed June 9, 1977, Cl. 219/121, SURFACE MODIFICATION, Daniel S. Gnanamuthu, et al., Owner of Record: *Avco Everett Research Laboratory, Inc., Everett, Mass.,* Attorney or Agent: M. E. Frederick, et al., Ex. Gp.: 213

4,017,418, Re. S.N. 801,627, Filed May 31, 1977, Cl. 252/309, PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLAR ORGANIC SOLVENTS, Charles Edward Crompton, et al., Owner of Record: *Chemetron Corporation, Chicago, Ill.,* Attorney or Agent: Nicholas M. Esser, et al., Ex. Gp.: 223

PATENT NOTICES

Certificates of Correction for the Week of July 26, 1977

3,525,225	4,004,497	4,015,695	4,019,496
3,729,502	4,005,006	4,016,029	4,019,511
3,792,577	4,005,811	4,016,137	4,019,535
3,795,099	4,008,039	4,016,139	4,019,584
3,834,981	4,009,230	4,016,405	4,019,863
3,835,800	4,009,949	4,016,530	4,020,051
3,840,187	4,010,571	4,016,589	4,020,053
3,862,392	4,011,151	4,016,863	4,020,228
3,907,813	4,011,451	4,017,120	4,020,234
3,916,098	4,012,109	4,017,192	4,020,566
3,917,395	4,012,454	4,017,266	4,020,682
3,917,541	4,012,474	4,017,483	4,020,707
3,922,268	4,012,480	4,017,487	4,021,084
3,928,228	4,012,716	4,017,683	4,021,106
3,931,104	4,013,118	4,017,831	4,021,169
3,947,612	4,013,169	4,017,898	4,021,232
3,947,662	4,013,423	4,017,951	4,021,295
3,950,110	4,013,465	4,017,975	4,022,001
3,956,043	4,013,520	4,018,071	4,022,184
3,965,068	4,013,560	4,018,519	4,022,347
3,973,277	4,013,579	4,018,599	4,022,353
3,989,336	4,013,772	4,018,612	4,022,574
3,990,528	4,014,006	4,018,616	4,022,594
3,993,672	4,014,183	4,018,697	4,022,891
3,998,924	4,014,799	4,018,915	4,023,351
4,000,624	4,014,810	4,018,917	4,023,525
4,000,811	4,014,880	4,018,940	4,023,730
4,001,836	4,015,037	4,019,300	4,024,272
4,003,148	4,015,055	4,019,405	
4,003,840	4,015,414	4,019,433	

Disclaimers

3,009,525.—*Robert DeLiban*, Glenview, Ill. GUIDANCE SYSTEMS. Patent dated Nov. 21, 1961. Disclaimer filed May 12, 1977, by the assignee, *Barrett Electronics Corporation*.

Hereby enters this disclaimer to claims 17 and 21 of said patent.

3,297,172.—*Lester W. Haaker* and *Demetrius G. Jclatis*, Red Wing, and *Carelton E. Jennrich*, St. Paul, Minn. MASTER-SLAVE MANIPULATOR. Patent dated Jan. 10, 1967. Disclaimer filed Jan. 28, 1977, by the assignee, *Central Research Laboratories, Inc.*

Hereby enters this disclaimer to claims 20, 21, 22 and 24 of said patent.

3,625,793.—*David S. Sheridan*, Argyle, and *Isaac S. Jackson*, Greenwich, N.Y. BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE. Patent dated Dec. 7, 1971. Disclaimer filed Apr. 14, 1977, by the assignee, *Mallinckrodt, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,801,669.—*Harold F. Christmann*, Seabrook, Tex. PURIFICATION OF HYDROCARBONS. Patent dated Apr. 2, 1974. Disclaimer filed May 5, 1977, by the assignee, *Petro-Tex Chemical Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 of said patent.

3,805,724.—*Frank W. Butler*, Westlake Village, Calif. SAILBOAT CANOPY APPARATUS. Patent dated Apr. 23, 1974. Disclaimer filed May 9, 1977, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,855,562. *Hackchan Rhee*, Indianapolis, Ind. CIRCUIT BREAKER WITH AMBIENT TEMPERATURE COMPENSATION. Patent dated Dec. 17, 1974. Disclaimer filed May 26, 1977, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,911,892.—*Garrett H. Harris*, Jackson, Miss. STOVE CONSTRUCTION. Patent dated Oct. 14, 1975. Disclaimer filed May 12, 1977, by the assignee, *Newco Fireplace Equipment Limited, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,922,387.—*John Robert Larry*, Youngstown, N.Y. METALLIZATIONS COMPRISING NICKEL OXIDE. Patent dated Nov. 25, 1975. Disclaimer filed May 26, 1977, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to all claims of said ptaent.

3,973,737.—*Kurt Eiglmeier*, Idstein, Taunus, Germany. PROCESS FOR THE MANUFACTURE OF AROMATIC 1,3-DIKETONES. Patent dated Feb. 10, 1976. Disclaimer filed May 23, 1977, by the assignee, *Hoechst Aktiengesellschaft*.

Hereby enters this disclaimer to claim 1 of said Patent.

3,952,574.—*John A. Spcidel*, Maineville, Ohio. PROCESS AND APPARATUS FOR FORMING SHEET METAL STRUCTURES. Patent dated Apr. 27, 1976. Disclaimer filed May 11, 1977, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

3,978,576.—*Jack Mustoe, Jr.*, Cumbernauld, Scotland. NAIL EXTRACTOR. Patent dated Sept. 7, 1976. Disclaimer filed May 24, 1977, by the assignee, *Glentorc Timber Products Limited*.

Hereby enters this disclaimer to claims 12 and 17 of said patent.

3,985,876.—*John R. Hazlett* and *Elvin A. Holstius*, Greenville, N.C. CHEMOTHERAPEUTIC SOLUTIONS CONTAINING A SULPHUR AND A SALT OF A 2,4-DIAMINO-5-BENZYLPYRIMIDINE. Patent dated Oct. 12, 1976. Disclaimer filed May 10, 1977, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to claims 1 to 14 of said patent.

4,030,682.—*Tsugio Goto*, Nobeoka, Japan. APPARATUS FOR THE TREATMENT OF YARN THICKNESS VARIATION SIGNALS. Patent dated June 14, 1977. Disclaimer filed Mar. 14, 1977, by the assignee, *Asahi Kasei Kogyo Kabushiki Kaisha*.

The term of this patent subsequent to May 20, 1992, has been disclaimed.

Disclaimer and Dedication

Design No. 234,792.—Maurice H. O'Link, St. Cloud, Minn. BUOYANT VEST. Patent dated Apr. 8, 1975. Disclaimer and dedication filed May 26, 1977, by the assignee, *Stearns Manufacturing Company*.

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Service by Publication

Buck R. Young

In accordance with 37 CFR 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on December 29, 1971, of an application for patent entitled "Coating for Multi-Wall Bags," on behalf of Buck R. Young, whose last known address is The Helena Motel, Helena, Arkansas 72342. The application was made in compliance with 37 CFR 1.47(b) and 35 U.S.C. 118 by The Hudson Pulp & Paper Corporation without execution by the said Buck R. Young. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Buck R. Young in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 18, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-1-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-10-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,939,145 to 2,943,326, inclusive
Plant Patents..... Numbers 1,950 to 1,956, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

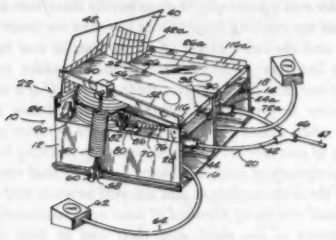
Re. 29,317
PNEUMATIC LUNG ANALOG

Kenneth C. Mosley, Grand Rapids, and Clare E. Barkalow, Comstock Park, both of Mich., assignors to Michigan Instruments, Inc., Grand Rapids, Mich.

Original No. 3,808,706, dated May 7, 1974, Ser. No. 327,503, Jan. 29, 1973. Application for reissue Sept. 17, 1976, Ser. No. 724,211

Int. Cl.[2] G09B *23/28*

U.S. Cl. 35—17 **31 Claims**



1. A pneumatic lung analog comprising, in combination: a frame; a bellows in said frame, said bellows simulating a lung, said bellows having a stationary end plate secured to said frame and a movable end plate secured to said frame, said movable end plate being pivotal relative to said stationary plate; said bellows having air inlet and air outlet means for inflating and deflating said bellows, said movable end plate pivoting away from said stationary end plate when the flow of air is into said bellows and moving toward said stationary end plate when the flow of air is out of said bellows, said air inlet means defining a passageway having a preselected cross section flow area to simulate a preselected flow resistance through the respiratory track; means biasing said movable end plate toward said stationary end plate, said biasing means *including a spring connected at one end to said movable end plate and at the other end to said frame, said spring providing a force against said movable end plate urging it toward said stationary end plate when said bellows is expanded and* acting as a resistance to the expansion of said bellows, said biasing means simulating the respiratory compliance in a lung; *adjustment means for adjusting the force of said spring acting on said movable end plate, said adjustment means including attachment means anchoring the ends of said spring at various locations radially from the axis of pivot of said movable end plate so that the tension on said spring can be varied for a given angular movement of said movable end plate;* and indicating means associated with said movable end plate, said indicating means providing a performance readout of said lung analog in response to flow through said air inlet means.

Re. 29,318
DEVICE FOR THE DETECTION OF EXCESSIVE THREAD TENSION AND THREAD BREAKAGE

Jacques Palencher, Troyes, France, assignor to Lebocey Industrie, Troyes, France

Original No. 3,896,640, dated July 29, 1975, Ser. No. 349,014, Apr. 9, 1973. Application for reissue Nov. 26, 1976, Ser. No. 724,860

Claims priority, application France, Apr. 28, 1972, 72.15365

Int. Cl.[2] D04B *35/12, 35/14*

U.S. Cl. 66—161 **2 Claims**

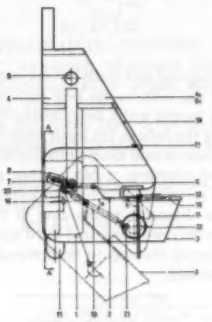
1. A device for detecting the breakage of, and excessive tension in, the thread operating in a knitting machine comprising:

a. a case;

b. a first detection lever pivotally mounted to said case, said first detection lever being arranged and configured to detect the breakage of said thread;

c. a second detection lever pivotally mounted to said case, said second detection lever being arranged and configured to slidably support said thread; and

d. a spring means having first and second ends, said first end thereof being connected to said case at a first point and said second end thereof being connected to said second detection lever at a second point thereon, the return force of said spring tending to maintain said second detection lever against an abutment, said first and second points being situated on opposite sides of an imaginary straight



line joining the axis of rotation of said second detection lever and the point at which said thread engages said second detection lever, said first point being situated nearer to the axis of rotation of said second detection lever than to said point at which said thread engages said second detection lever, and said second point being situated nearer to said point at which said thread engages said second detection lever than to the axis of rotation of said second lever the length of said spring being approximately equal to the distance between the axis of rotation of said second detection lever and said point at which said thread engages said second detection lever,

whereby, said second detection lever is responsive to excessive tension in said thread by pivoting about its axis of rotation and against the return force of said spring until said thread escapes [thereform] *therefrom*.

Re. 29,319
DRAINAGE SYSTEM FOR INCISIONS OR WOUNDS IN THE BODY OF AN ANIMAL

Harvey M. Nordby, Buffalo Grove; John L. Nolan, Glenview, and Bremen I. Johnson, Cary, all of Ill., assignors to Hollister Incorporated, Chicago, Ill.

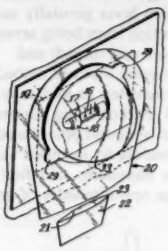
Original No. 3,954,105, dated May 4, 1976, Ser. No. 565,614, Apr. 7, 1975. Continuation of Ser. No. 402,047, Oct. 1, 1973, abandoned. Application for reissue Oct. 29, 1976, Ser. No. 737,142

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—275 **5 Claims**

4. A drainage system for draining fluids from an opening such as a wound or incision in the body of an animal, said system being usable in combination with a drain having a

portion within the body and a portion extending outwardly of the body through said opening, said drainage system comprising a sheet of soft, pliable, plastic material, a blanket of gelatinous material adhered to one face of the sheet to be placed in contact with and thereby to sealingly engage the external area of the body surrounding the opening, said sheet and blanket being adapted to have an aperture formed therein exposing only said opening and the drain therein while covering and isolating the area of the body surrounding said opening and drain, a bag of thin plastic material having an inner wall and an outer wall, said walls being secured together at their peripheral



edges to form a bag and said walls having opposed holes therein, a relatively stiff but deformable ring surrounding each of said holes and sealed to said walls, an adhesive-carrying face on the ring surrounding the hole in the inner wall for securing the bag to the opposite face of said sheet with the hole in the inner wall surrounding said aperture, a cap of thin plastic material secured to a third relatively stiff but deformable ring of approximately the same diameter as the ring in the outer wall, and means for removably securing said third ring to the ring in the outer wall to permit the cap to be removably secured to the outer wall of the bag.

Re. 29,320

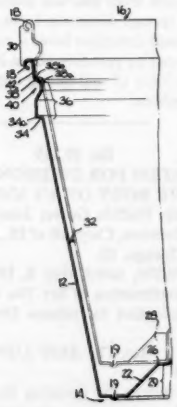
NESTABLE CONTAINERS

Daniel R. Kalata, Smithtown, N.Y., and Henry H. Huston, Burlington, Vt., assignors to Owens-Illinois, Inc., Toledo, Ohio

Original No. 3,347,411, dated Oct. 17, 1967, Ser. No. 442,398, Mar. 24, 1965. Continuation of Ser. No. 302,780, Nov. 1, 1972, abandoned, which is a continuation of Ser. No. 827,437, March 26, 1969. Application for reissue Feb. 6, 1974, Ser. No. 440,141

Int. Cl.[2] B65D *21/02*

U.S. Cl. 206—519 **10 Claims**



7. A nestable container comprising a bottom wall, a circumferential sidewall extending upwardly and generally inclined outwardly from said bottom wall and ending in a peripheral rim at its upper extent, and a combined stacking ridge and lid receiving area including said rim and the portion of said sidewall extending downwardly therefrom, said stacking ridge and lid receiving area comprising a shoulder adjacent the upper end of said container and extending generally horizontally outwardly from the inclined portion of said sidewall to form the lowermost extent of the stacking ridge portion of said area, a face section inclined and projecting inwardly and upwardly from said shoulder, and extending a shelf extending outwardly and upwardly from the upper extent of said face section and spaced downwardly from the top of said rim, the vertical distance between said shoulder and said shelf being defined as the top stacking height, the outer extent of said shoulder being greater than the inner extent of said shelf, the outer extent of substantially all portions of said sidewall which are intermediate said shoulder and a point spaced downwardly therefrom a distance equal to said top stacking height being less than the inner extent of said shelf, and the outer extent of all portions at and below said point being less than the inner extent of said shoulder, so that the shoulder of one such container can seat on the shelf of a next lower like container to provide a stacking means between two such containers when nested together, the distance between said shelf and the top of said rim being less than said top stacking height and the outer periphery of said shelf being joined to said rim with all portions of the inner surface of said sidewall between said shelf and the top of said rim being disposed at least as far outwardly as said outer periphery of the shelf, said shelf and at least the upper portion of said face section below said shelf forming a lid sealing means of said area.

Re. 29,321

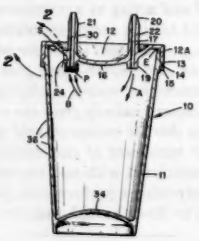
FLUID COLLECTION BOTTLE AND IMPROVEMENTS THEREIN

LeGrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Original No. 3,878,962, dated Apr. 22, 1975, Ser. No. 412,329, Nov. 2, 1973. Continuation of Ser. No. 857,161, Sept. 11, 1969, abandoned. Application for reissue Dec. 12, 1975, Ser. No. 640,059

Int. Cl.[2] B65D *47/12*

U.S. Cl. 215—309 **6 Claims**



1. A vacuum operated fluid collection bottle for recovering body fluids and comprising a container and a centrally concave cover *removably* secured thereto, said concave cover being essentially rigid and having an inwardly convex interior surface and an outwardly concave exterior surface, said concave cover being essentially rigidly constructed in such configuration, prior to vacuum application, whereby to insure against cover collapse when a vacuum is applied, said [bottle] *cover* being provided with a fluid admittance port and a vacuum port, both of said ports communicating with the interior of said bottle.

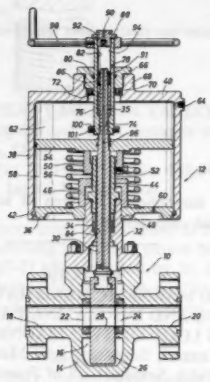
Re. 29,322
VALVE AND ACTUATOR ASSEMBLY

Norman A. Nelson, Houston, Tex., assignor to Teledyne Merla, div. of Teledyne, Inc., Garland, Tex.

Original No. 3,765,642, dated Oct. 16, 1973, Ser. No. 184,837, Sept. 29, 1971. Application for reissue Oct. 15, 1975, Ser. No. 622,601

Int. Cl.[2] F16K *3/02, 31/143*

U.S. Cl. 251—14 **37 Claims**



1. A valve and actuator assembly comprising:

valve body means defining a valve chamber and having flow passage means intercepting said valve chamber;

seat means disposed within said valve chamber about said flow passage means;

gate means being movably disposed within said valve chamber and having sealing engagement with said seat means, said gate having a flow port for registry with said flow passage means to conduct the flow of effluent through said valve and having an imperforate portion to block the flow of effluent;

bonnet means defining a closure for said valve chamber;

fluid motor means being carried by said bonnet means and having piston means movably disposed therein;

valve stem means having upper and lower extremities, the lower extremity being connected to said gate means and being connected to said piston means, said valve stem means cooperating with said valve body to define a first pressure responsive area of said stem means;

stem drive means engaging said stem means and being operative to impart reciprocal movement to said stem means;

balancing means carried by said stem means and cooperating with said stem drive means to define a second pressure responsive area of said stem means; and

means communicating effluent pressure from said valve chamber to each extremity of said valve stem and causing pressure induced forces acting on said first and second pressure responsive areas of said stem to be substantially balanced.

33. A valve and actuator assembly comprising:

valve body means defining a valve chamber and having flow passage means intercepting said valve chamber;

gate means being movably disposed within said valve chamber and having a flow port for registry with said flow passage means to conduct the flow of effluent through said valve and having a solid portion to block the flow of effluent;

bonnet means defining a closure for said valve chamber;

a fluid motor means attached to said bonnet means and having a housing defined by top and bottom walls and a generally cylindrical wall;

a piston being movably disposed within said housing and dividing said housing into first and second chambers;

means communicating pressurized actuating fluid into said first chamber to impart movement to said piston and said valve stem in one direction;

means venting said second chamber;

means imparting a force to said piston in a direction opposing said one direction;

valve stem means interconnecting said gate means and said piston;

stem drive means engaging said stem means and being operative to impart reciprocal movement to said stem means;

means defining an internal shoulder on said top wall of said housing;

thrust shoulder means being carried by said stem drive means within said housing and being engageable with said internal shoulder to limit axial movement of said stem drive means in one direction;

passageway means being defined in said piston to vent said actuating fluid from said first chamber into said second chamber; and

vent seal means being positionable in sealing relation between said stem drive means and said piston to block said passageway means and being positionable in non-sealing relation with said piston to open said passageway means.

Re. 29,323
ELECTROPHOTOGRAPHIC COPYING APPARATUS

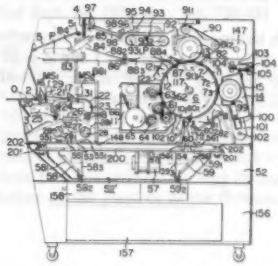
Kazuo Kawakubo, Kawasaki; Motoharu Fujii, Tokyo, and Masao Ariga, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,770,345, dated Nov. 6, 1973, Ser. No. 20,210, Mar. 17, 1970. Application for reissue July 21, 1975, Ser. No. 597,906

Claims priority, application Japan, Apr. 16, 1969, 44-28971; Mar. 21, 1969, 44-21214

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **53 Claims**



1. An electrophotographic copying apparatus comprising in combination: a variable path for the transportation of an original to be reproduced; means for transporting an original over said path; control means for said path and means for detecting the passage of an original both arranged in said path, *said control means including a guide plate for guiding said original to be reproduced, guide plate positioning means adapted to shift said guide plate between first and second positions, cam means controlling operation of said guide plate positioning means and provided with a plurality of spaced pins, and cam driving means operable by signals from said detecting means to act upon said pins and shift said cam means, whereby* said control means [being] *is* adapted to establish a continuous recirculating path in response to a signal generated by said detecting means when the latter first detects an original inserted in said path through an inlet thereto, thereby circulating an original that has been inserted through said path so as to obtain more than one copy from an original that has been inserted, said control means being further adapted to alter said path in response to a signal generated by said detecting means when the latter detects the completion of a predetermined number of circulations of an original in said path, thereby discharging an original that has been circulated;

means for illuminating an original as it is being transported by said transporting means for deriving a projectable image therefrom; a photosensitive drum rotatably mounted upon a shaft; means for forming an electrophotographic image on said drum arranged around the periphery of said drum and including an optical system for projecting said projectable image upon said drum; means for feeding image transfer material; means for transferring an image from said drum to transfer material fed by said feeding means; and means for fixing an image on transfer material to which an image has been transferred.

Re. 29,324

N-SUBSTITUTED ASPARTYL PEPTIDE AMIDES

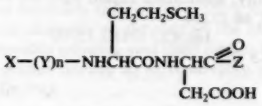
David A. Jones, Skokie, and Robert H. Mazur, Deerfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Original No. 3,875,137, dated Apr. 1, 1975, Ser. No. 352,865, Apr. 20, 1973. Application for reissue Feb. 5, 1976, Ser. No. 655,322

Int. Cl.[2] **C07C** *103/52*

U.S. Cl. 260—112.5 R **13 Claims**

1. A compound of the formula



wherein X is hydrogen or a tertiary-butoxycarbonyl radical, Y is a tryptophanyl radical, n is 0 or 1 and Z is an amine residue wherein the amine is an alkyl amine, cycloalkyl amine, or heterocyclic amine [or aralkyl amine].

Re. 29,325

HERMETIC POWER PACKAGE

Billy M. Hargis, Cleveland, Tenn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,681,513, dated Aug. 1, 1972, Ser. No. 109,888, Jan. 26, 1971. Application for reissue July 16, 1973, Ser. No. 379,364

Int. Cl.[2] **H01L** *1/12, 1/14*

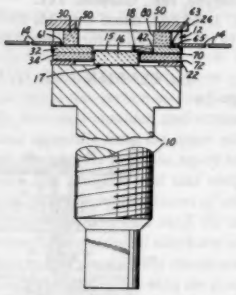
U.S. Cl. 174—52 S **4 Claims**

1. A package adapted for a power-consuming chip device comprising:

A. a metallic heat conductive base

B. a low expansion metallic shim brazed to said base and,

C. A *terminal-bearing and* lead-bearing alumina ceramic *ring or* collar *having a central opening and* having metallic surfaces at least partially covering the top and bottom surfaces[,] *and external terminals connected to internal terminals within the central opening by buried leads,* said *ring or* collar being sealed to said base by brazing to said



shim and surrounding an area of said base adapted to receive said chip device.

Re. 29,326

INTEGRATED MAGNETIC HEAD HAVING ALTERNATE CONDUCTING AND INSULATING LAYERS WITHIN AN OPEN LOOP OF TWO MAGNETIC FILMS

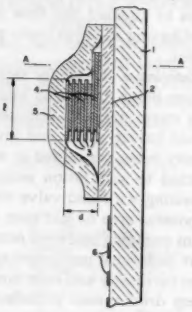
Jean Pierre Lazzari, Seyssinet; Igor Melnick, Grenoble, and Jean-Yves Valet, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Original No. 3,723,665, dated Mar. 27, 1973, Ser. No. 81,881, Oct. 19, 1970. Application for reissue Apr. 15, 1976, Ser. No. 677,433

Claims priority, application France, Oct. 28, 1969, 69.36863

Int. Cl.[2] **G11B** *5/20, 5/22, 5/42*

U.S. Cl. 360—123 **7 Claims**



1. An integrated magnetic head for reading and/or writing, a magnetic circuit for said head comprising an open loop of two magnetic films joined together at one end and disposed at the other end in proximity to the wiring and/or reading surface and substantially at right angles to said surface, and an electric winding for writing and/or reading within said loop comprising in an alternate arrangement a succession of electrically conducting and electrically insulating film layers at least partially superposed in a direction substantially at right angles to the plane of said magnetic films, wherein said loop has a convergent shape at the level of the opening of said open loop, wherein an electrically conducting layer having its two faces adjacent to two electrically insulating layers is level with the open end of said loop forming a gap, the other layers being set back towards the interior of said loop.

PLANT PATENTS

GRANTED JULY 26, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,082

ROSE PLANT-MELISSA VARIETY

Gayle Kent McDaniel, Carlton, Oreg., assignor to Carlton Rose Nurseries, Carlton, Oreg.

Filed May 24, 1976, Ser. No. 689,641

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from seed parent No. 1968-L and pollen parent No. 167-D characterized by its ability to yield medium-sized long lasting blooms on a continuous basis in a greenhouse substantially as shown as described.

4,083

ROSE PLANT—JOFITALI VARIETY

Willem De Witte, Aarbergerweg 15, Rijsenhout (Post Aalsmeer) Commune de Haarlemmeneer, Netherlands

Filed May 24, 1976, Ser. No. 689,503

Claims priority, application Netherlands, May 28, 1975, 752882; Morocco, Oct. 31, 1975, 17283

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of Grandiflora rose-plant of vegetative reproduction, characterized by the fact that

from the physical point of view, the plant is erect; the flower is double, very luminous Rose Bengal on the inside and Spiraea Red on the outside; the flower initially has a high-centered form;

from the biological point of view, this rose-plant is of vigorous vegetation, has an excellent capacity for reblooming, great resistance to diseases, and its flowers last a long time whether on the plant or when cut;

substantially as shown and described.

4,084

NECTARINE TREE

Sam Parnagian, 410 E. Adams, Fowler, Calif. 93625

Filed Aug. 18, 1976, Ser. No. 715,339

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, characterized by its vigorous growth and large size; its bearing of early ripening, very highly colored, clingstone, yellow fleshed fruit which ripens from 10 to 14 days earlier than the fruit of the Armking nectarine tree (U.S. Plant Pat. No. 2,943) and which is smoother, glossier and more highly colored than the fruit of the Mayred nectarine tree (U.S. Plant Pat. No. 2,758); and which is further distinguished from the Armking nectarine tree by its even more vigorous growth and more nearly spherical fruit.

4,085

LILY PLANT NAMED STAR GAZER

Ted T. Kirsch, Sitkum Rte. Box 142, Myrtle Point, Oreg. 97458

Filed Sept. 24, 1976, Ser. No. 726,481

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental hybrid lily plant substantially as herein shown and described, characterized by its very large upwardly facing flowers borne on strong, stiff vertically projecting pedicels, by the substantially overall bright red coloring of the sepals and petals which are bordered by a marginal band of white, and by the long lasting quality of the blooms whether on the plant or as cut flowers.

PATENTS

GRANTED JULY 26, 1977

ERRATA

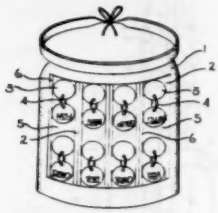
For CLASS	See PATENT NO.
210–077	4,037,338
084–474	4,037,518
296–061	4,037,564
123–003	4,037,568
211–106	4,037,737
237–008 R	4,037,779
285–005	4,037,859
432–112	4,038,021
428–596	4,038,040
428–576	4,038,041
428–625	4,038,042
261–089	4,038,353
427–248 E	4,038,430
023–230 B	4,038,485
361–230	4,038,583
361–104	4,038,584
361–334	4,038,585
361–435	4,038,586
361–321	4,038,587
364–200	4,038,640
364–900	4,038,641
364–90	4,038,642
364–200	4,038,643
364–900	4,038,644
364–200	4,038,645
235–151	4,038,668
358–127	4,038,679

PATENTS

GRANTED JULY 26, 1977

GENERAL AND MECHANICAL

4,037,272
RECIPE APRON
Esther G. Shani, 1670 Huntington Drive, South Pasadena, Calif. 91030
Filed May 20, 1976, Ser. No. 688,419
Int. Cl.[2] A41D *13/04*
U.S. Cl. 2—48 **6 Claims**

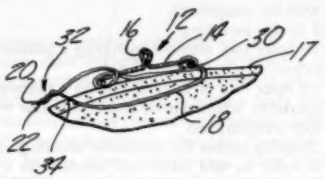


1. A recipe apron comprising:
an apron;
a plurality of rings coupled to said apron;
a plurality of recipe sheets coupled to said rings; and
a plurality of transparent cover sheets extending over said recipe sheets, each of said transparent cover sheets, being fixed along one edge thereof to said apron and being detachably coupled along the other edge thereof to said apron whereby said cover sheets may be detached along one edge to allow a user to flip through the recipe sheets and reattach to said apron thereby holding said recipe sheets in place and protecting said recipe sheets from stains.

4,037,273
EAR PROTECTOR
Wallace F. Labaire, 9 Pleasant St., Worcester, Mass. 01608
Filed June 20, 1975, Ser. No. 588,596
Int. Cl.[2] A41D *21/00*
U.S. Cl. 2—209 **1 Claim**

1. A method of forming an ear protector, comprising the steps of,
a. forming an inner container having an inner, upwardly-convex dome and having a peripheral, upwardly-concave trough, the trough having an uppermost and outermost peripheral sealing edge,
b. placing the inner container in a fist sealing mold, which mold has a sealing surface positioned adjacent and beneath the sealing edge of the inner container,
c. concentrically connecting an annular resilient ring to a rigid ring,
d. fixing a head strap to the rigid ring,
e. placing the rigid ring with the resilient ring downwardly and concentrically in the trough of the inner container,
f. placing a sound-damping material over the upwardly-facing surface of the dome of the inner container,
g. forming an outer container having a sealing edge corresponding to the sealing edge of the inner container,
h. placing the outer container in a second sealing mold which has a sealing surface positioned adjacent to and over the sealing edge of the outer container,
i. bringing the first and second sealing mold together, so that the sealing edges of each container are in contact, except that a portion of the head strap passes between the sealing edges at predetermined locations, and
j. causing the sealing surfaces to bring about a hermetic seal between the inner and outer containers at their sealing edges.

4,037,274
APPLIANCE AND METHOD FOR FACILITATING HAIRPIECE ATTACHMENT
Frank L. Agosta, 26061 Fernwood, Roseville, Mich. 48066
Filed Aug. 25, 1975, Ser. No. 607,345
Int. Cl.[2] A61F *1/00;* **A61B** *17/00;* **A61L** *17/00*
U.S. Cl. 3—1 **5 Claims**



1. An appliance for facilitating the attachment of a hairpiece to the scalp of a person, comprising:
a. a snap member, the snap member comprising a base and an upstanding projection,
b. an elongated suture having a first end and a second end, the suture being connected to the snap member medially of the suture, and
c. a surgical needle connected to the suture at the first end thereof, the needle comprising a hook element and a connecting element integrally formed therewith, the connecting element being detachably connected to the first end of the suture, and
wherein the first end of the suture is adapted to be inserted into the scalp via the needle beneath the snap member and exited from the scalp proximate the second end of the suture such that the two ends of the suture are interconnectable to render the snap member detachably connected to the scalp.

5. A method for detachably connecting a hairpiece to the head of a person, comprising:
a. placing on the scalp at a predetermined position an appliance comprising:
1. a snap member having a base and an upstanding projection,
2. an elongated suture having a first end and a second end, the snap member being mounted to the suture medially thereof, and
3. a surgical needle, the first end of the suture being detachably connected to the needle,
b. inserting the needle into the scalp at a first point,
c. drawing the needle through the scalp beneath the snap member,
d. withdrawing the needle from the scalp at a second point thereof proximate the second end of the suture, such that

the first end of the suture is drawn through the scalp beneath the snap member and is withdrawn from the scalp proximate the second end of the suture,

e. detaching the needle from the first end of the suture,

f. joining together the first and second ends of the suture above the scalp,

g. securing to a hairpiece a snap member having a recess for receiving the projection, and

h. snapping the projection into the recess.

4,037,275

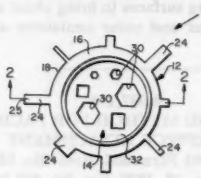
SPORTSMAN'S SCREWDRIVER AND WRENCH

Fred O. Schor, Rte. 4, Box 367, Harrison, Ark. 72601

Filed Aug. 24, 1976, Ser. No. 717,122

Int. Cl.[2] B25F *1/00*

U.S. Cl. 7—1 G **3 Claims**



3. A tool kit comprising,

a tool device including:

1. an outer tool member including a plurality of radially extending screw driver heads,

2. an inner tool member including a plurality of wrench apertures, adapted to be interchangeable with said outer tool member, and

3. coupling means for releasably securing said inner tool member to said outer tool member in a substantially horizontal plane such that either of said tool members may be utilized individually or in assembled relation with each other,

b. said outer tool member includes:

i. a body portion having an outer peripheral edge and an inner spaced apart edge defining an opening in said body portion,

ii. said screw driver heads extend outwardly from said outer peripheral edge and integrally formed therewith, and

iii. said plurality of screw driver heads each differ as to length or width thereof,

c. said inner tool member includes:

iv. a plate having an outer peripheral wall in matching conformity to said opening, and

v. said wrench apertures extend through said plate and vary in size,

d. said coupling means includes:

vi. a peripherally extending gasket mounted in fixed relationship to said opening, and

vii. a peripherally extending groove in said gasket adapted to receive therein said outer peripheral wall of said inner tool member,

e. a file,

f. a container of oil, and

g. a cloth.

4,037,276

MULTIFUNCTIONAL TOOL FOR RESCUE WORK

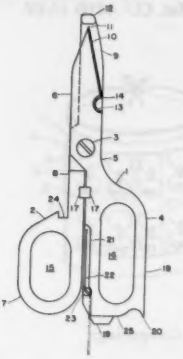
Reiner G. Brinker, 5424 Camille Drive, Mechanicsville, Va. 23111

Filed May 17, 1976, Ser. No. 687,253

Int. Cl.[2] B26B *11/00*

U.S. Cl. 7—6 **8 Claims**

8. In a pair of shears comprising two elongated integral substantially flat members, each comprising a handle portion, shank portion and substantially straight blade portion, said members being pivotably connected in coplanar opposed relationship by a threaded bolt in a manner such that said blade portions can be brought into sliding, overlapping contact, at least one of said blade portions being provided with a straight beveled cutting edge, and tapering to a pointed tip, the improvement comprising an arcuate beveledged recess located between said bolt and said pointed tip on said blade portion



provided with a straight beveled cutting edge, the forward extreme of said recess meeting with said beveled cutting edge at a doubly beveled juncture having an angle of less than 100° and adapted to initiate a cutting action by a puncturing or gripping effect in a sheet structure acted upon by said shears, propagation of said cutting action being achieved by said straight beveled cutting edge, said shears being adapted to operation by a single hand of the user.

4,037,277

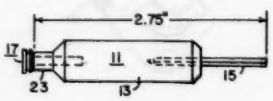
SURGICAL TOOL

Frederick J. Shipko, Spring Church, Pa., assignor to Coratomic Inc., Indiana, Pa.

Filed Aug. 30, 1976, Ser. No. 718,794

Int. Cl.[2] B25F *1/00*; B23P *19/02*; B25B *13/48*

U.S. Cl. 7—1 G **5 Claims**



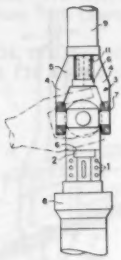
1. In combination a heart pacer having a socket for receiving a terminal for effecting an electrical connection to said heart, and also having an opening extending from said socket laterally of said socket and a thread in said opening for receiving a set screw to secure said terminal to said socket, and a surgical tool for use in the implanting said heart pacer in the heart of a host, the said tool comprising a handle, a wrench for screwing a set screw into said thread for securing said terminal in said socket, secured in one end of said handle, and a plug for sealing said opening, said plug having a stem and being removably held by said stem in the opposite end of said handle.

4,037,278

DEVICE FOR COUPLING A CARDAN HALF-JOINT WITH A FIXED STRUCTURE

Giuseppe Dotti, Milan, Italy, assignor to Snam Progetti S.p.A., Milan, Italy

Filed Dec. 3, 1975, Ser. No. 637,125
Claims priority, application Italy, Dec. 3, 1974, 30122/74
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R 1 Claim



1. A device anchoring a structure below sea level, comprising:

a pair of opposing forks, each of which has a pair of opposing prongs, a shank connected to said prongs, and a seat in said shank adjacent to where said prongs diverge from one another,

a cross pin extending through said prongs which unite said opposing forks,

opposing shafts to which said forks are secured, wherein one of said shafts is anchored below sea level and the other one of which is connected to a movable body, and wherein each of said shafts includes a radial projection adapted to be received by a recess in each of said seats of each of said forks, and

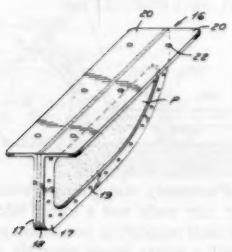
a plurality of bolts which extend through each of said shanks of said forks in a direction perpendicular to the pull forces on said forks for securing said forks to said shafts without being subjected to pull forces on said shafts.

4,037,279

WATER SKI

Herbert F. Ziebart, 6981 Deepwater Point Road, Rte. 2, Williamsburg, Mich. 49690

Filed Oct. 17, 1975, Ser. No. 623,430
Int. Cl.[2] A63C *15/00*
U.S. Cl. 9—310 A 4 Claims



1. In a water ski, the combination comprising

a water ski body having a forward end, a rear end, a top side and a bottom side,

a fin extending downwardly from the bottom side,

said fin comprising two spaced frames and an elastic element interposed between said frames and defining an elastic portion of substantially uniform thickness movable laterally of the water ski body under the action of water,

said water ski body including a longitudinally extending slot,

said frames extending through said slot,

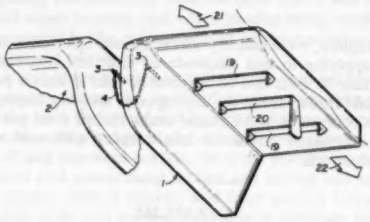
said frame elements having flanges integral therewith and engaging the top side of said water ski.

4,037,280

APPARATUS FOR WALKING ON WATER OR LAND

Christian Klepsch, Post Kirschberg, Haus, near 16, Doesingerried, Germany (8371)

Filed Sept. 5, 1975, Ser. No. 610,788
Claims priority, application Germany, Sept. 7, 1974, 2442948
Int. Cl.[2] A63C *15/04*
U.S. Cl. 9—310 D 13 Claims



1. An apparatus or walking on water or land, comprising floatation means, each floatation means including a substantially vertically arranged floatation body forming a keel and a substantially horizontally arranged floatation body forming a stabilization member, means operatively interconnecting said floatation bodies to each other so that two floatation means forming a pair have a mirror symmetrical shape relative to each other whereby each of the respective vertically arranged floatation bodies has a vertical surface and the vertical surfaces of the pair face each other to extend substantially in parallel to each other when the pair is in use, said apparatus further comprising paddle means, and means operatively securing said paddle means to said floatation means whereby said paddle means normally extend downwardly but flap backwardly when the respective floatation means is pulled through the water, and wherein said paddle means comprise at least one paddle structure including a first portion and a second portion extending substantially at a right angle to said first portion, said first and second paddle portions being rigidly connected to each other to form said paddle structure, said securing means hinging said first portion to said substantially horizontal floatation body whereby said second paddle portion performs a stabilizing function.

4,037,281

FASTENER MANUFACTURING METHOD

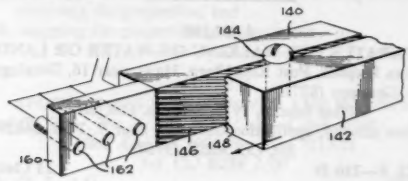
Richard L. Reynolds, Palos Verdes, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 554,734, March 3, 1975, Pat. No. 3,972,084, which is a division of Ser. No. 479,650, June 17, 1974, Pat. No. 3,968,533, which is a continuation-in-part of Ser. No. 353,449, April 23, 1973, Pat. No. 3,894,570. This application May 14, 1976, Ser. No. 686,413
Int. Cl.[2] B21H *3/02;* B23G *9/00;* B23K *9/04*
U.S. Cl. 10—10 R 5 Claims

1. A method of manufacturing an impregnated, threaded fastener comprising the steps:

a. forming a helical thread having thread crests on a shank portion of a fastener blank by cold-rolling said fastener shank portion between a pair of thread-forming dies by reciprocating at least one of the dies relative to the other of said dies to advance the fastener blank positioned therebetween by rolling;

b. mechanically feeding at least said thread crests of said fastener shank into rotational contact each 120° of the circumference on the outside diameter of the thread on said fastener shank with an electrode positioned adjacent to said dies and having an impregnatable substance by continuing the movement of said reciprocating thread-forming die;



c. rapidly, mechanically vibrating said electrode; and

d. applying to said electrode an electrical potential of less than 50 volts and 50 amperes so that at least a portion of said thread crests are impregnated with the impregnatable substance as said fastener shank thread crest portions are rotationally advanced into contact with said vibrating electrode.

4,037,282

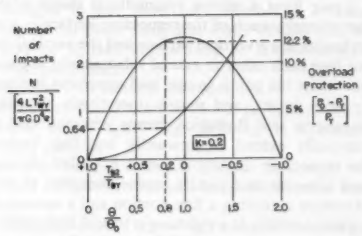
PROCESS FOR CREATING OVERLOAD PROTECTION AGAINST YIELDING IN BOLTS

Norman C. Dahl, 40 Fern St., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 664,574, March 8, 1976. This application June 7, 1976, Ser. No. 693,546

Int. Cl.[2] F16B *31/02*

U.S. Cl. 10—27 R **7 Claims**



1. A method for creating built-in overload protection against further yielding in a threaded bolt which previously has been tightened to its yield point, said method comprising: reducing the torque acting in the shank of said bolt to fifty percent or less of the valve existing at the end of tightening, said reduction in torque being accomplished by rotating the bolt head or the nut in the direction opposite from tightening through an angle θ such that the reduction in twist of said shank causes said torque to reduce to fifty percent or less of the value existing at the end of tightening and where said angle of rotation θ is not large enough to cause decrease in the tension existing in said bolt at the end of tightening.

4,037,283

ELECTRIC STIPPLING DEVICE

David Moisiuk, 103 Quincy Drive, Regina, Saskatchewan, Canada

Filed Aug. 3, 1976, Ser. No. 711,281

Int. Cl.[2] B43L *19/00*

U.S. Cl. 15—4 **3 Claims**

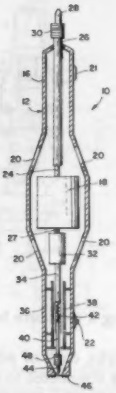
1. An electric stippling device comprising in combination:

an elongated housing;

an electric motor mounted within an intermediate section of said housing, a rotatable motor shaft extending from each of the opposed ends of said housing longitudinally of said housing;

an eraser member mounted adjacent one end of said housing and projecting therefrom, said eraser member being connected to the motor shaft extending from one end of said motor to be rotatable therewith;

a stippling shaft member mounted within said housing adjacent the other end of said housing having a stippling point affixed thereto;



means operably connecting said stippling shaft member with the motor shaft extending from the other end of said motor and adapted to convert the rotary movement of said motor shaft into reciprocatory movement of said stippling shaft member;

and means for selectively activating said motor and thereby rotating said eraser member and reciprocating said stippling shaft member.

4,037,284

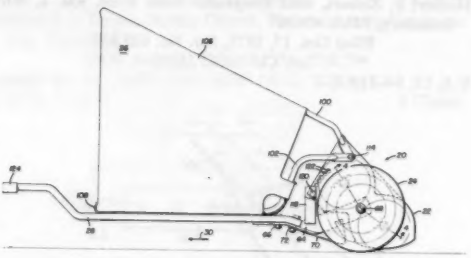
SWEEPER ASSEMBLY

Raymond F. McDonald, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed June 10, 1976, Ser. No. 694,731

Int. Cl.[2] E01H *1/04*

U.S. Cl. 15—83 **6 Claims**



1. A rotary sweeper assembly, comprising a enclosed housing having a top and side walls and a lower inlet opening, ground tranversing wheels supporting said housing for movement along the ground, a rotary brush assembly within said housing enclosure lifting particulate material into said housing through said inlet opening and propelling the particulate material out of a forwardly opening outlet adjacent the tops of said housing enclosure and a hopper adjacent said outlet forward of said housing receiving particulate material, the improvement comprising a drag-guard plate extending from said hopper assembly at an acute angle to the ground surface toward said

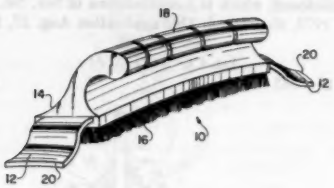
lower inlet opening, then said plate being turned upwardly adjacent said housing but spaced therefrom, said plate extending substantially across the entire forward end of said housing and the lower face defining an arcuate drag surface spaced below the lower forward end of said housing protecting said housing and lifting the sweeper assembly upon engaging an accumulation of particulate material.

4,037,285

BRUSH FOR CLEANING WHITEWALL TIRES

Bela Bottos, 1308 H Stone Mill Court, Stone Mountain, Ga. 30083

Filed Feb. 24, 1976, Ser. No. 660,993
Int. Cl.² A46B 9/02
U.S. Cl. 15—160 **4 Claims**



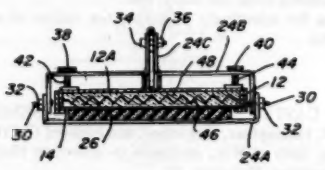
1. A brush for cleaning the whitewall portion of a whitewall tire, the tire being of the type wherein said whitewall portion is generally circular and is recessed to define a groove, said brush comprising a base having a top and bottom, a plurality of outwardly projecting bristles mounted on said base so as to define an arcuate scrubbing surface having a width and radius of curvature corresponding to the width and radius of curvature, respectively, of the whitewall groove, a handle connected to said base top, and a resilient guide flap projecting longitudinally outwardly from each end of said base; said guide flaps having a width corresponding to the width of the whitewall groove and being curved such that the lateral edges thereof define S-curves and the distal end portions ride in the whitewall groove in spring-biased engagement therewith when said brush is in operative contact with the tire.

4,037,286

REARVIEW MIRROR FOR VEHICLES

G. P. Medearis, 1021 Faulkner Lane, Waco, Tex. 76704; Sam F. Williams, Jr., P.O. Box 35, Leroy, Tex. 76654, and Morris O. Medearis, 2526 N. Cheyem, P.O. Box 2332, Tulsa, Okla. 74101

Filed Jan. 14, 1976, Ser. No. 649,028
Int. Cl.² B60S 1/24, 1/44
U.S. Cl. 15—250.05 **3 Claims**



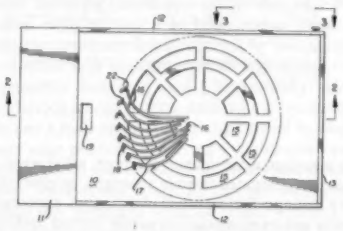
1. An outside rearview mirror for a vehicle, comprising:
a rectangular vertical frame adaptable to be supported outside a vehicle;
a mirror supported by said frame in the front portion thereof, the mirror having a front surface and a rear surface;
a gear motor supported to said frame, the gear motor having a drive shaft extending therefrom;
a crank arm secured at the inner end to said drive shaft for rotation by said gear motor;
a wiper bracket slidably supported on said frame for vertical reciprocation;
a horizontal squeegee member secured to said wiper bracket engaging said mirror front surface;
a first and second vertical guide member each secured at the upper and lower ends thereof to the back surface of said frame, the guide members being spaced apart from and parallel to each other, the portion of said guide members intermediate the ends being spaced from said frame, said wiper bracket being slidably received between said frame and said guide members intermediate portion whereby said wiper bracket is reciprocally retained in position relative to said frame, a pair of vertically aligned spacers positioned opposite said first and second vertical guide members; and
a connecting rod extending from the outer end of said crank to said wiper bracket, said wiper bracket being vertically reciprocated by the rotation of said gear motor drive shaft to wipe said mirror, and
wherein said wiper bracket includes a rearward portion and a forward portion, the rearward portion extending adjacent the back surface of said frame and having one end of said connecting rod pivotally attached to the central portion of said rearward portion, the front portion extending adjacent said mirror front surface and having said squeegee member affixed thereto, said front portion being detachable from said rearward portion to facilitate the replacement of said squeegee member, said rearward portion being slidable between said vertical spacers and said vertical guide members.

4,037,287

BUFFING MACHINE PAD CLEANING DEVICE

Richard E. Whittaker, 302 S. Croton Ave., New Castle, Pa. 16101

Filed Aug. 16, 1976, Ser. No. 714,991
Int. Cl.² A46B 17/00
U.S. Cl. 15—257 R **5 Claims**



1. A buffing machine pad cleaning device comprising a raised, substantially flat platform having a plurality of relatively large openings therein, a plurality of bars positioned on and attached to said platform in a radial pattern overlying said openings, said bars defining an area substantially the same size as said buffing machine pad so that the same can be positioned thereon and rotated thereagainst by said buffing machine.

4,037,288

FILAMENT LIQUID QUENCHING APPARATUS

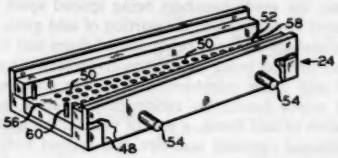
Richard D. Meyer, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 395,036, Sept. 7, 1973, Pat. No. 3,905,381.
This application June 19, 1975, Ser. No. 588,559
Int. Cl.² B08B 3/00; A47L 5/34
U.S. Cl. 15—302 **3 Claims**

1. Apparatus for removing liquid from filaments comprising:
a longitudinal chamber wherein a plurality of apertures are

located in a substantially flat surface of said chamber over which said filaments are passed parallel to the lengthwise dimension of said chamber and in contact therewith and a means in communication with said chamber for removing fluids therefrom:

a liquid quench tank positioned immediate the longitudinal chamber comprising a tank for storing a quench liquid;



at least one baffle in said quench tank to dampen the movement of quench liquid wherein said baffle contains an opening through which said filaments pass and a perforated area to permit circulation of said quench liquid but which reduces turbulence of said quench liquid;

means for guiding said filaments through said tank; and

a weir to control the level of quench liquid in said tank.

4,037,289

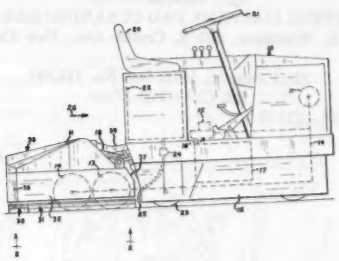
SCRUBBER SQUEEGEE APPARATUS

Harold D. Dojan, Cedar, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,265

Int. Cl.[2] A47L *7/00, 1/06*

U.S. Cl. 15—320 **21 Claims**



1. For a surface maintenance machine, a squeegee assembly comprising an elongated flexible squeegee, an elongated squeegee frame having a first terminal end portion, a second terminal end portion and an elongated arcuately curved backing surface intermediate portion between said end portions, and operable quick release means for clamping the squeegee against the backing surface and retaining the squeegee in a squeegee working position on the frame and alternately for releasing the squeegee, said quick release means including an over center locking device that is operable between a squeegee clamping position and a squeegee release position, an elongated band having a first end portion, an intermediate portion and a second end portion, said band first end portion and squeegee frame first end portion having cooperating means for transmitting a force from the band to the squeegee frame to move the band intermediate portion toward the backing surface intermediate portion when the locking device is operated from its release position toward its clamping position, means for connecting the device to the band second end portion, and means for connecting the locking device to the squeegee frame second end portion, the last mentioned means including an elongated second band having a first end portion connected to the locking device, and a second end portion, said second band second end portion and squeegee frame second end portion having cooperating means for transmitting a force from the second band to the squeegee frame when the locking device is operated from its release position toward its clamping position, the locking device comprising means for forcing the bands to exert a force on their second end portions to move them away from one another when the locking means is moved from its release position toward its clamping position, and the cooperating means including squeegee frame portions to limit the movement of the band second end portions away from one another.

4,037,290

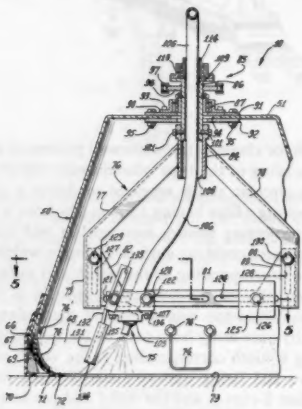
VACUUM CLEANING DEVICE

James J. Rose, Sylmar, and Edward L. Horton, San Gabriel, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Division of Ser. No. 518,579, Oct. 29, 1974, Pat. No. 3,916,568, which is a continuation-in-part of Ser. No. 483,357, June 26, 1974, abandoned, which is a continuation of Ser. No. 360,192, May 14, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,045

Int. Cl.[2] A47L *5/14*

U.S. Cl. 15—345 **19 Claims**



1. In a vacuum cleaning device to remove debris from a surface, the combination of:

a hood supported on and movable along the surface and having its open side confronting the surface to form therewith a traveling vacuum chamber;

a nozzle in the hood directed towards the surface and mounted for circular orbital movement therein;

means to supply to the nozzle compressed air substantially free of entrained particles to agitate the debris on the surface;

means to withdraw air from the hood to maintain a vacuum therein and to entrain and withdraw the agitated particles of debris from the body; and

means for selectively adjusting the radius of said circular orbit.

4,037,291

CASTER AND SWIVEL LOCK ASSEMBLY

David F. Huempfner, Kewaunee, and Richard C. Tringali, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

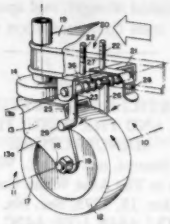
Filed Aug. 19, 1976, Ser. No. 715,979

Int. Cl.[2] B60B *33/00, 33/02*

U.S. Cl. 16—35 R **15 Claims**

1. A swivel caster assembly including a swivel mount, a leg connected to said swivel mount for swivel movement about a generally vertical swivel axis, and a wheel supported by said leg for rotational movement about a generally horizontal rotation axis, said rotation axis being spaced behind said swivel axis

when said wheel is in a trailing position, the improvement wherein a locking and releasing member is pivotally mounted and positioned for automatically releasably locking said wheel in said trailing position, said member comprising a shaft and a finger projecting radially therefrom, means supporting said shaft for pivotal movement about a generally horizontal pivot axis between a locking position wherein said finger is lowered and a releasing position wherein said finger is raised above said wheel, said shaft having said pivot axis disposed behind said swivel axis, said finger being directly engageable with the periphery of said wheel when said finger is lowered and when said wheel is swiveled towards said trailing position in one direction to ride upon said wheel and thereby promote smooth



movement of said member from a lowered to a partially raised position above said wheel, said member pivoting under the influence of gravity from said partially raised position into said locking position as said wheel fully reaches said trailing position, and said finger thereafter being directly engageable with the periphery of said wheel when said finger is lowered and when said wheel is swiveled towards a new trailing position in the other direction to ride upon said wheel and thereby promote smooth movement of said member from a lowered to a partially raised position above said wheel, said member pivoting under the influence of gravity from said releasing position into said lowered position as said wheel fully reaches said new trailing position.

4,037,292

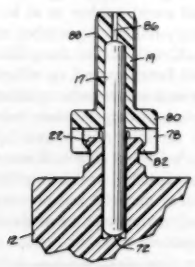
UNIVERSAL STEM FOR A CARPET CASTER

Sidney D. Lapham, 2324 Tice Creek Drive Manor No. 3, Walnut Creek, Calif. 94595

Division of Ser. No. 502,180, Aug. 30, 1974, Pat. No. 3,984,724. This application Oct. 20, 1975, Ser. No. 623,678

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—38 **4 Claims**



1. A universal stem for casters having a caster body including an annular collar formed thereon, and having a bearing surface formed therein, said stem being arranged to be mounted to a receiving socket in an object to be castered comprising:

a. a stem cap having a stem portion adapted to engage said socket, and a shroud portion adapted to loosely fit over said collar for rotation thereabout; and

b. a pin-type bearing member extending axially through said stem cap and into said caster body when said caster is assembled, said bearing member rotatably bearing at one of its ends against said bearing surface in a substantially point contact relationship to permit free rotation of said caster body with respect to said stem;

c. said shroud portion having resilient jaws equipped with flanges adapted to be snapped over said collar to prevent said stem cap and caster body from separating under the influence of gravity.

4,037,293

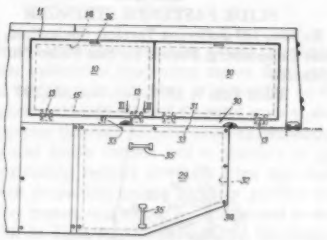
HINGE AND PANEL MOUNTING MEANS

Michael P. Morge, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 675,029

Int. Cl.[2] E05D *1/06*

U.S. Cl. 16—171 **5 Claims**



1. In a vehicle having a vertically extending housing portion provided with an opening, said housing portion defining a horizontally extending edge portion at a lower edge of said opening, and a closure panel for selectively closing said opening and having a lower edge portion, improved hinge means for hingedly mounting said closure panel lower edge portion to said housing edge portion, said hinge means comprising: a tubular female connector fixedly carried by said housing edge portion adjacent said opening thereof with the bore of the female connector extending axially horizontally, said female connector having an end portion defining a downwardly opening notch; and a male connector fixedly carried by said closure panel lower edge portion and having a cantilevered end defining a horizontal axis spaced outwardly from said closure panel to be passed transversely upwardly through said female connector notch into abutment with the female connector above the notch thereby to cause the male connector to be disposed in coaxial alignment with said tubular female connector bore to be moved axially horizontally thereinto to hingedly mount said closure panel to said housing.

4,037,294

METHODS AND APPARATUS FOR FILLETING FISH

William Pirie Cowie, Aberdeen; Fraser Donaldson, New Deer, and Geoffrey John Grantham, Aberdeen, all of Scotland, assignors to Lever Brothers Company, New York, N.Y.

Filed May 9, 1975, Ser. No. 575,868

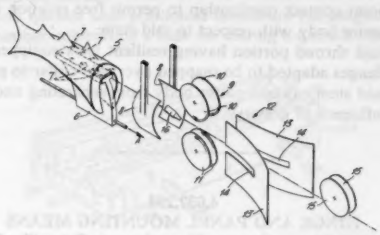
Claims priority, application United Kingdom, May 14, 1974, 21221/74

Int. Cl.[2] A22C *25/16*

U.S. Cl. 17—56 **10 Claims**

1. A method of filleting fish comprising the steps of making a pair of initial longitudinal cuts into the fish one on each side of, closely adjacent, and parallel to the vertebral column of the fish to be filleted, which cuts pass down through the skin towards but not into the parapophyses, accommodating

ploughs in each of said initial cuts, and by relative movement between the ploughs and the fish, drawing a side fillet clear of



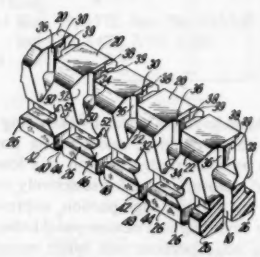
the rib and pin bones and main bone structure on each side of the fish.

4,037,295

SLIDE FASTENER STRINGER

Fred H. Rojahn, 107 Jefferson Terrace, Springfield, N.J. 07081, and Jose Lichtenberg, Fuente De San Pedro No. 17, Mexico City, Mexico

Filed Feb. 9, 1976, Ser. No. 656,397
Int. Cl.[2] A44B *19/14*
U.S. Cl. 24—205.13 D **4 Claims**



1. A stringer for a slide fastener comprising:

an elongated body having two leg portions connected by a bight portion to define a generally U-shaped configuration in transverse cross section, said U-shaped configuration being generally rigid to maintain said leg portions in a predetermined spaced apart position relative to each other;

a first plurality of transverse slots disposed between closed ends of said bight portion of said body to provide a plurality of longitudinally spaced apart head members;

a second plurality of transverse slots disposed between free open ends of said leg portions of the body to provide a plurality of longitudinally spaced apart legs on each side of said head members;

longitudinally extending groove means provided in an outside side surface of each of said legs for receiving stitches when the stringer is sewn to a fabric;

said first and said second plurality of slots being arranged in a longitudinally alternating pattern to provide a pair of legs facing each other between adjacent head members, each leg of said pair being connected to each of said adjacent head members;

said first plurality of slots being defined by pairs of inclined wall surfaces extending inwardly from an outside surface of said bight portion of said U-shaped body, each of said pairs of inclined wall surfaces defining a V-shaped configuration with an open end of said V-shaped wall surfaces being adjacent each other at said head members for longitudinal flexibility thereof to permit said adjacent head members to be spread apart when closing and opening the slide fastener;

said second plurality of slots being defined by sets of inclined walls extending inwardly from an outside surface of each of said leg portions of said U-shaped body, each of said sets of inclined walls defining a V-shaped configuration with an open end of said V-shaped walls being adjacent each other at said groove means for longitudinal flexibility thereof to permit relative movement between longitudinally adjacent legs when closing and opening the slide fastener;

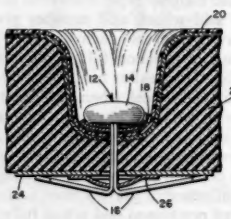
said leg portions being relatively close together at said free open ends thereof to provide a longitudinally extending aperture for receiving the fabric therebetween, said leg portions being relatively widely spaced apart adjacent said closed ends of said bight portion for providing a longitudinally extending recess for receiving head members of an associated stringer, said aperture and said recess being in direct open communication with each other.

4,037,296

METHOD AND ARTICLE FOR TUFTING UPHOLSTERY AND THE LIKE, AND THE RESULTING ARTICLE OF MANUFACTURE

Douglas M. White, Stamps, and Alga L. White, Lewisville, both of Ark., assignors to The Alan White Company, Stamps, Ark.

Filed Dec. 15, 1975, Ser. No. 640,967
Int. Cl.[2] A44B *1/18*; A47C *27/00*
U.S. Cl. 24—90 B **9 Claims**



1. A pliable upholstery-reinforcing washer for use with a fastener to tuft a vinyl-type non-woven upholstery material, said fastener comprising a prong button adapted to extend through an aperture in said non-woven upholstery material and a foam upholstery material positioned therebeneath, through an aperture in a rigid fiber washer and through an aperture in a metal washer with the button head of said prong button adapted to be disposed atop said non-woven upholstery material and with the prongs of said prong button bent sideways on the backside of said metal washer so as to tuft said material, said pliable upholstery-reinforcing washer comprising a pliable base having an aperture therein so as to slidably receive therethrough one of said fasteners and an adhesive on the side of said base adjacent said non-woven upholstery material, said pliable upholstery-reinforcing washer being adapted to be fixedly positioned on said non-woven upholstery material beneath the button head and atop said non-woven upholstery material whereby said pliable washer reinforces the hole in said non-woven upholstery material and prevents the button head from stretching and tearing said non-woven upholstery material adjacent the aperture therein.

4,037,297

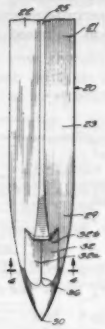
FELTING NEEDLE WITH BARBED TIP

Edson Perkins Foster, Cato, Wis., assignor to Foster Needle Company, Inc., Manitowoc, Wis.

Filed June 15, 1976, Ser. No. 689,394
Int. Cl.[2] D04H *18/00*
U.S. Cl. 28—115 **15 Claims**

1. A barbed felting needle having a non-circular blade portion with a plurality of faces and with a ridge between each

pair of adjacent faces, a tapered point portion at the outermost end of the blade portion converging to a tip, at least one barb



disposed in the tapered point between the tip and the blade portion.

4,037,298

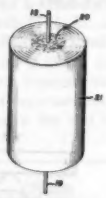
METHOD OF MAKING A PARTIALLY IMPREGNATED CAPACITOR

Robert J. Flanagan, Hudson Falls; Richard C. Conners, and Richard C. Merrill, both of Glens Falls, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Division of Ser. No. 506,461, Sept. 16, 1974; Pat. No. 3,987,348. This application Sept. 15, 1975, Ser. No. 613,452

Int. Cl.[2] H01G *4/22*

U.S. Cl. 29—25.42 **7 Claims**



1. A process of making a hard roll capacitor section comprising in combination

a. winding a capacitor roll on a hard core using only synthetic resin strips which are heat shrinkable and some of which are metallized,

b. maintaining a tension on said strips during said winding of above about 200 grams per inch of strip width per mil thickness,

c. subjecting said roll to an elevated temperature correlated to said winding tension and over a period of time to significantly heat shrink said synthetic resin strips on said hard core to rigidize said roll,

d. inserting said rigid roll in a casing and covering the ends of said roll with a dielectric liquid,

e. and sealing said casing,

f. whereby said roll section has a substantially dry central section which predominates the distance between the roll edges which is not penetrated by the dielectric liquid, and narrow margin sections at said edges which are wet by said dielectric liquid.

4,037,299

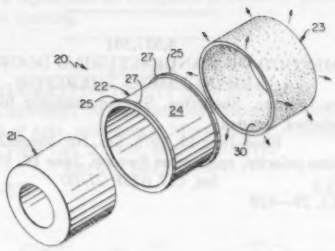
TEXTILE COT ASSEMBLY

Kenneth C. Smith, Westhoughton, near Bolton, England, assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 581,321, May 27, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,921

Int. Cl.[2] B21B *31/08*

U.S. Cl. 29—130 **6 Claims**



1. A textile cot assembly comprising a rigid cylindrical core; a rigid tubular cylindrical supporting means fixed concentrically around said core and having a supporting surface adjoined at opposite edges thereof by a pair of annular shoulders of greater diameter than said surface; and an elastomeric sleeve having a tubular inside surface and a plurality of gripping projections extending radially inwardly from said inside surface with each projection having an inner portion engaging said supporting means, said sleeve being disposed in stretched condition with its diameter increased within the range of approximately 3 to 8 percent from its unstretched condition, the outer diameter of said sleeve, when stretched and seated, being greater than the outside diameter of said shoulders, said inner portions of said projections being partially deformed at their area of contact with said supporting means by radially inward pressure exerted by said stretched sleeve, said projections with their partially deformed inner portions preventing rotation of said sleeve relative to said supporting means.

4,037,300

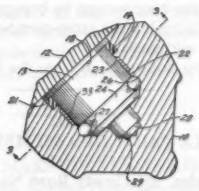
DRILLING BIT BEARING STRUCTURE

Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Irvine, Calif.

Division of Ser. No. 546,936, Feb. 4, 1975, Pat. No. 4,021,084. This application Apr. 5, 1976, Ser. No. 673,391

Int. Cl.[2] B21D *53/10*

U.S. Cl. 29—148.4 R **7 Claims**



1. A process for forming an improved bearing surface in a rock bit cutter cone of high strength alloy steel, the bearing surface having spaced portions of hard-facing alloy with increased resistance to formation of cracks and propagation of cracks into and through the cone, comprising steps of:

forming a cutter cone blank of high strength alloy steel;

forming a cylindrical blank bearing surface in a bore of the cutter cone blank;

forming a plurality of shallow pockets spaced apart from each other in the cylindrical blank bearing surface;

filling each of the pockets with a wear resistant hard-facing alloy having a hardness greater than the hardness of the alloy steel when carburized and hardened; and

grinding the hard-facing alloy and blank bearing surface to form a finished bearing surface;

the resulting composite bearing surface being characterized by a decreased tendency, as compared to a continuous ring of hard-facing alloy, to form large propagating cracks in the individual portions of hard-facing alloy.

4,037,301

METHOD OF MANUFACTURING DOORS AND ARRANGEMENT THEREFOR

Anders Lövgren, Skelleftea, Sweden, assignor to UTEC AB, Skelleftea, Sweden

Filed June 13, 1975, Ser. No. 586,692

Claims priority, application Sweden, June 14, 1974, 7407872

Int. Cl.[2] B23P *21/00*

U.S. Cl. 29—429 **4 Claims**

1. A method for the manufacture of a door of the kind comprising two parallel spaced webs of flexible material connected to laterally spaced cross-members and comprising the steps of:

a. feeding in parallel fashion from each of two supply sources a continuous web of a flexible material which said webs are maintained under tension while supported on a frame, the feeding of said webs occurring a step at a time and by an amount substantially equalling a preselected spacing between supporting cross-members,

b. inserting in the space between said two webs at intervals corresponding to the preselected spacing an elongate cross-member extending in the direction transverse to the direction of feed of the webs,

c. securing the two webs on respectively opposite sides of each cross-member,

d. repeating steps (a) through (c) until the preselected door dimension is obtained,

e. severing the attached webs from their respective frames,

f. telescoping the door section by bringing into substantially abutting relationship the cross-members which have been attached to said webs,

g. removing the door section from the frame.

4,037,302

USED VEHICLE PARTS DISASSEMBLY SYSTEM AND METHOD

John M. Hollander, 205 County Road No. 6, Wayzata, Minn. 55391

Filed Feb. 23, 1976, Ser. No. 660,684

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—403 **22 Claims**

1. A method for providing used vehicle parts obtained from used vehicles which comprises:

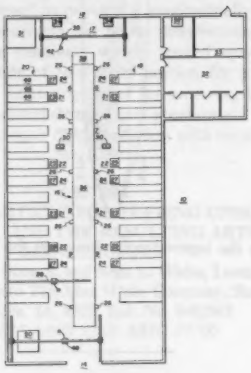
conveying a used vehicle along a fixed conveyor line;

sequentially disassembling at various locations along said conveyor line, while preserving in recyclable condition, substantially all recyclable used parts from the used vehicle;

identifying the sequentially disassembled used vehicle parts;

storing the sequentially disassembled used vehicle parts in a storage area; and

entering and maintaining inventory information on the used vehicle parts in a record-keeping system wherein said inventory information is based on inventory numbers



which indicate the interchangeability of certain vehicle parts between various makes, models and years, whereby the availability of said used vehicle parts can be determined and a desired used vehicle part and its interchangeable equivalents can be located among the recyclable used vehicle parts stored and identified in the storage area of said integrated system.

4,037,303

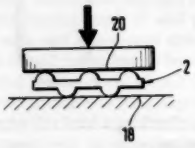
METHOD FOR THE BRIQUETTING OF METAL SWARF, PELLETS, AND POWDERS WITH ROLLER PRESSES

Hartmut Rieschel, Hattingen, Ruhr, Germany, assignor to Maschinenfabrik Koppern GmbH & Co., KG, Hattingen, Germany

Filed Mar. 25, 1975, Ser. No. 561,977

Int. Cl.[2] B22F *3/24*

U.S. Cl. 29—420.5 **8 Claims**



1. A method of briquetting metal swarf, pellets, powders and the like comprising the following steps:

A. directing said metal materials to a roller press comprising opposed briquetting rollers having mold depressions located in the surfaces thereof with the mold depressions in said rollers being arranged in staggered relation so that they do not overlap when disposed in opposite relation;

B. processing said metal materials between said rollers to form a metal extrusion comprising a generally flat web having a plurality of solid molded portions extending from opposite surfaces thereof, said molded portions all being of substantially the same size and shape and being arranged in closely adjacent, side-by-side relation to define aligned transverse and longitudinal rows extending across the web with each adjacent molded portion extending from opposite surfaces of the web, whereby each side of the web defines a checkered pattern;

C. positioning said extrusion between opposed continuous surfaces that extend from side to side of the extrusion; and

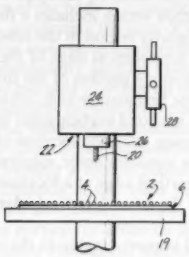
D. simultaneously applying pressure against opposite sides of the extrusion by said opposed surfaces, with said pressure being substantially normal to the plane of said extrusion so as to simultaneously engage the outermost surfaces only of the oppositely extending molded portions of at least one transverse row, thereby causing the extrusion to break along the web portions interconnecting adjacent molded portions so as to separate the latter to form individual briquettes.

4,037,304

METHOD OF REMOVING RODS FROM METALLIC ANODES

Thomas L. Cummings, Ocoee, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed June 24, 1976, Ser. No. 699,552
Int. Cl.² B23P *19/00*
U.S. Cl. 29—427 **6 Claims**



1. A method of removing a portion of a rod from a metallic anode of the type used in chlor-alkali electrolytic cells without damaging adjacent rods, said anode having a foraminous surface comprised of a plurality of closely spaced, substantially parallel rods, said rods being welded at method comprising

a. mounting a drill bit in a chuck with a free end of the drill bit foreshortened to a length no more than twice the diameter of the drill bit so that the drill bit does not skip off the surface of the rod,

rotating the drill bit at a suitable speed for drilling said rod;

c. advancing the rotating drill bit through said rod to be removed at at least two separate locations, said rod being free of weldments between said locations, and

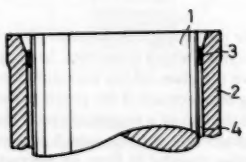
d. removing the portion of the rod between the two locations.

4,037,305

METHOD FOR HYDROSTATIC EXTRUSION

Hans Gunnar Larsson, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Sweden

Filed June 29, 1976, Ser. No. 700,789
Claims priority, application Sweden, Sept. 24, 1975, 7510692
Int. Cl.² B23P *17/00*
U.S. Cl. 29—421 R **9 Claims**



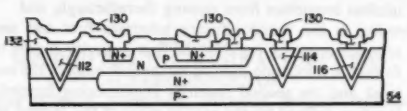
1. Method for manufacturing rod-shaped compound products by hydrostatic extrusion of a compound billet containing a core of a first material and a casing, surrounding the core, of a second material, with a gap between the casing and the core, which comprises applying a sealing ring (3,13,23) with greater thickness than the gap (4) between the core and the casing around the rear end of the core (1), inserting the core (1) into the casing (2), then pressing the sealing ring (3,13,23) to stick in the gap (4) between the core (1) and the casing (2) so that the sealing ring (3, 13, 23) and/or the casing (2) are deformed, inserting the billet formed of the core (1) and the casing (2) into a hydrostatic extrusion press and forming the billet under the influence of a liquid into an elongated product by pressing it through a die opening.

4,037,306

INTEGRATED CIRCUIT AND METHOD

Ronald J. Gutteridge, Scottsdale, and George A. Stickney, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 619,121
Int. Cl.² B01J *17/00*
U.S. Cl. 29—577 **5 Claims**



1. A method for manufacturing an integrated circuit comprising the steps of:

a. providing a semiconductor substrate having an upper layer;

b. forming device junctions in said upper layer;

c. forming an oxide layer over the surface of said upper layer;

d. forming a metal masking layer over the surface of said oxide layer;

e. forming a predetermined pattern of openings through said metal masking and oxide layers;

f. forming recessed regions in the surface of said semiconductor substrate using said predetermined pattern of openings as a mask, said recessed regions extending below the surface through said upper layer thereby isolating device regions containing said device junctions;

g. removing portions of said oxide layer overhanging the periphery of said recessed regions using said metal masking layer as a mask;

h. removing said metal masking layer without removing said oxide layer;

i. forming a thin insulating layer in said recessed regions;

j. forming metal regions in said recessed regions, the surface of said metal regions coinciding with said surface of said upper layer; and

k. electrically connecting said metal regions to a potential source to form an equipotential interconnecting network, said network selectively connectable to said device junctions and to other electrical components of said integrated circuit.

4,037,307

METHODS FOR MAKING TRANSISTOR STRUCTURES

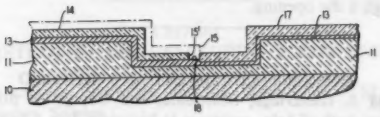
George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,532
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **10 Claims**

1. A method for making transistors comprising the steps of: forming over a semiconductor substrate a first mask (e.g., 14) having an exposed portion including a first vertical edge

(e.g., 15) and then thereafter controllably removing a portion of the exposed surface of the first mask, including the portion of the first mask which defines the first vertical edge, to define a second vertical edge (e.g., 15') laterally removed a controlled distance from the location of the first edge;

forming over the semiconductor substrate a second mask having a first vertical edge at a location corresponding to the location of the first vertical edge of the first mask and



having a second vertical edge at a location corresponding to the location of the second vertical edge of the first mask, said second mask being characterized in that it inhibits impurities from passing therethrough; and

forming in the semiconductor substrate first and second separate impurity regions, the first impurity region being formed at a location defined by the first edge of the second mask and the second impurity region being formed at a location defined by the second edge of the second mask.

4,037,308

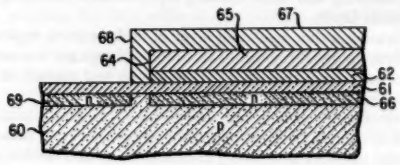
METHODS FOR MAKING TRANSISTOR STRUCTURES

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,533

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 3 Claims



1. A method for making transistors comprising:

the steps of forming over a semiconductor substrate a first mask having an exposed portion which includes a first vertical edge;

forming a first impurity region in the substrate at a location defined by the first vertical edge of the first mask;

forming a second mask which has a first vertical edge which abuts the first vertical edge of the first mask;

controllably increasing the lateral extent of the second mask to cause the first vertical edge thereof to be extended by a controllable amount to define a second vertical edge; and

forming a second impurity region in the substrate at a location defined by the second vertical edge of the second mask.

4,037,309

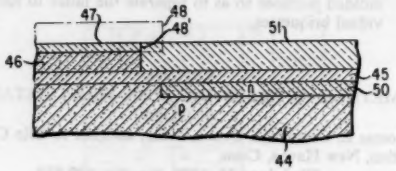
METHODS FOR MAKING TRANSISTOR STRUCTURES

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,355

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 4 Claims



1. A method for making transistors comprising the steps of:

forming over a semiconductor substrate a first mask having an exposed portion which includes a first vertical edge;

forming a first impurity region in the substrate at a location defined by the first vertical edge of the first mask;

controllably removing a portion of the first mask, including the portion of the first mask which defines the first vertical edge, to define a second vertical edge laterally removed a controlled distance from the location of the first edge;

forming over the semiconductor substrate a second mask having a first vertical edge at a location corresponding to the location of the second vertical edge of the first mask; and

forming a second impurity region in the substrate at a location defined by the first edge of the second mask.

4,037,310

METHOD OF MANUFACTURING A HOMOPOLAR ELECTRET FROM A FOIL

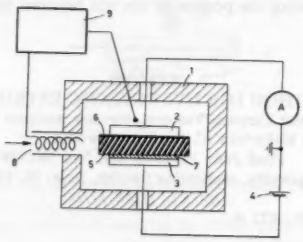
Jan van Turnhout, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,936

Claims priority, application Netherlands, Mar. 25, 1974, 7403965

Int. Cl.[2] B05D *5/12*

U.S. Cl. 29—592 15 Claims

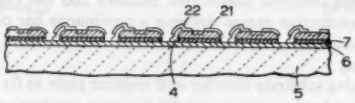


1. A method for producing a homopolar electret from a foil of a non-polar polymer which comprises, heating said foil to a temperature above the glass-rubber transition temperature but below the melting temperature of the polymer and applying an electrostatic field thereto of a magnitude such that a homopolar charge is injected into the foil which is greater than the desired charge value thereby to form an electret foil, cooling the foil to room temperature but removing the electrostatic field before said glass-rubber transition temperature is reached whereby the surplus charge is removed from the electret foil after removal of the field.

4,037,311
METHODS OF MANUFACTURING INFRA-RED DETECTOR ELEMENTS

Morris V. Blackman, and Michael D. Jenner, both of Southampton, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1976, Ser. No. 704,999
Int. Cl.[2] H01L *31/18*
U.S. Cl. 29—593 15 Claims

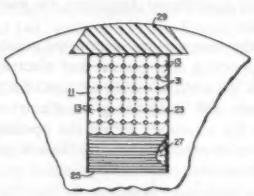


1. A method of manufacturing a plurality of infra-red detector elements each comprising a body of infra-red sensitive material having a substantially rectangular surface configuration with a pair of low resistance electrical contacts spaced apart on one surface of the body at opposite sides of a sensitive area of the element, comprising the steps of adhering a wafer of the infra-red sensitive material to a supporting body, forming a first plurality of substantially parallel extending channels extending in the wafer material to define on the supporting body a plurality of substantially parallel strip portions of the infra-red sensitive material, reducing the thickness of the strip portions to obtain a curvature of the exposed longitudinal edges of the strip portions, forming a second plurality of substantially parallel extending channels in the wafer material of the strip portions in a direction substantially normal to the longitudinal direction of the strip portions to define on the supporting body an array of substantially rectangular elemental body portions of the infra-red sensitive material each having curved edges on two opposite sides, depositing electrically conductive material to form on the surface of each elemental body portion a pair of electrical contact layers which are spaced apart and adjoin the oppositely located curved edges, and removing the elemental body portions with applied contact layers from the supporting body.

4,037,312
METHOD OF FABRICATING A MECHANICALLY STABLE ELECTRICAL WINDING HAVING COOLING OPENINGS THEREIN

Daniel W. Deis, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 307,314, Nov. 16, 1972, now Defensive Publication No. T915,004. This application Dec. 12, 1974, Ser. No. 532,288
Int. Cl.[2] H02K *15/09*
U.S. Cl. 29—598 8 Claims



1. A method of fabricating a superconductive electrical winding in a structure having a chamber to receive the winding comprising:

forming a plurality of superconductive filaments into a single strand;

encasing the strand of superconductive filaments in a normally conductive material to form a wire;

insulating the wire;

covering the insulated wire with a thermally responsive bonding material;

forming a plurality of the insulated wires covered with the thermally responsive bonding material into a composite cable;

placing a desired number of winds of the cable in the chamber;

compressing the winds in the chamber by means of a fluid pressurizing material, the pressure of said compressing being sufficient to cause the bonding material of adjacent wires in the winding to merge without filling in the interstices among the wires;

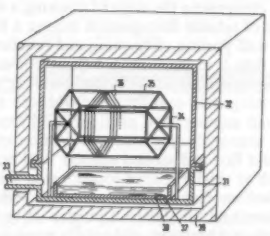
hardening the pressurizing material to maintain the winds in the compressed state; and

heating the structure to cause the bonding material to bond the wires together and secure them in the positions they occupy in the compressed winds.

4,037,313
METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTOR

Manfred Wilhelm, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 488,834, July 15, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,820
Claims priority, application Germany, Aug. 1, 1973, 2339053
Int. Cl.[2] H01V *11/00*
U.S. Cl. 29—599 18 Claims



1. An improved method for manufacturing a superconductor in the form of a superconductive intermetallic compound of the type A_3B with an A-15 crystal structure including at least two elements the first of which is a ductile element having a higher melting point and the second an element having a lower melting point comprising the steps of:

a. providing a single melt consisting of the second element;

b. providing a starting structure consisting of the first element surrounded by and embedded in a ductile carrier metal;

c. placing said melt and said starting structure together in a chamber with said starting structure disposed above said melt;

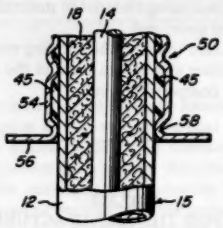
d. providing an inert atmosphere in said chamber by one of evacuating said chamber to a maximum residual gas pressure of 10^{-2} torr and pressurizing said chamber with an inert gas to a maximum pressure of 500 torr; and

e. heating both said single melt and starting structure to the same temperature, said temperature being between 600° and 950° C, and maintaining said temperature such that said melt forms a vapor of said second element, said vapor reacting with said starting structure such that said superconductive intermetallic compound is formed through the reaction of said vapor of said second element, diffusing through said ductile carrier metal, with said first element.

4,037,314
METHOD OF PRODUCING AN ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 5805 Folkestone Drive, Dayton, Ohio 45459

Division of Ser. No. 454,291, March 25, 1974, Pat. No. 3,930,140, which is a continuation-in-part of Ser. No. 334,002, Feb. 20, 1973, Pat. No. 3,800,415, which is a division of Ser. No. 244,516, April 17, 1972, Pat. No. 3,732,398, which is a continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application Dec. 15, 1975, Ser. No. 640,737
The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.
Int. Cl.[2] H05B 3/04
U.S. Cl. 29—611 6 Claims

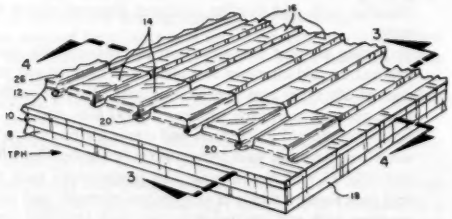


1. In a method of producing an electrical heating element assembly for mounting within spaced openings of a liquid heating vessel, and including the steps of forming an elongated tubular sheath having opposite end portions, positioning an elongated electrical resistance element within the sheath with a thermally conductive insulation material, and extending terminal members from the end portions of the resistance element through corresponding end portions of the sheath, the improvement comprising the steps of drawing a sheet of metal to form a pair of tubular fittings each having a flange portion and a tubular wall portion, deforming said tubular wall portion of each said fitting to produce a helical convoluted thread portion having a corrugated wall configuration in axial cross-section, deforming each said fitting to produce axially spaced first and second annular wall portions, positioning each said fitting on the corresponding said end portion of said tubular sheath with said first and second annular wall portions engaging said sheath at axially spaced locations on said sheath, and confining a fluid bonding and sealant material within the space defined between said tubular wall portion of each said fitting and said sheath and between said axially spaced first and second corresponding annular wall portions.

4,037,315
THERMAL PRINTING HEAD

Earl Wesley Stapleton; Patricia Ann McLaughlin, and Jerry Edwin Turnbaugh, all of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 572,499, April 28, 1975, abandoned, which is a division of Ser. No. 383,955, July 30, 1973, Pat. No. 3,903,393. This application Sept. 13, 1976, Ser. No. 722,989
Int. Cl.[2] H01C 7/02, 7/04
U.S. Cl. 29—612 4 Claims



1. A method of making a thermal printing head comprising the steps of:

applying conductive paste onto a surface of an insulating substrate member defining a common conductive member and conductive means spaced from each other and having ends spaced from said common conductive member;

firing said conductive paste and substrate member thereby fixing said common conductive member and conductive means in position on said substrate;

applying a paste of resistive material onto said common conductive member and the ends of said conductive means and to said substrate surface in the space between said common conductive member and the ends of said conductive means defining a continuous bar of resistive material;

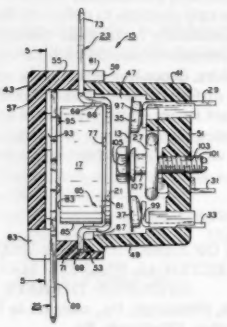
firing

cutting substrate member and resistine paste to fix said resistive bar in position on said common conductive member, ends of said conductive means and said substrate member; and cutting through said resitive bar to form discrete resistive members connected between said common conductive member and respective ones of said conductive means.

4,037,316
METHOD OF ASSEMBLING TEMPERATURE RESPONSIVE RESISTANCE MEMBER

Donald H. Stoll, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 508,457, Sept. 23, 1974, abandoned. This application Mar. 30, 1976, Ser. No. 671,961
Int. Cl.[2] H01H 11/00; H01C 17/02
U.S. Cl. 29—622 23 Claims



1. A method of assembling a temperature responsive resistance member so as to be enclosed within a chamber of a pair of separable housings with one of the housings having a pair of openings extending from the chamber exteriorly of the one housing generally in different directions, the method comprising the steps of:

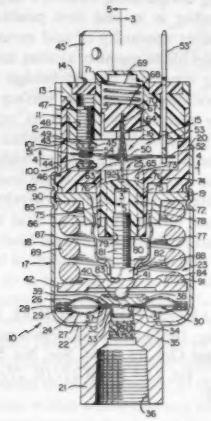
a. mounting the temperature responsive resistance member in both supporting engagement and electrical contacting engagement between a seating portion of a pair of electrical terminals and positioning an electrical connection portion on the terminals within the openings in the one housing so as to extend exteriorly thereof generally in the different directions, respectively; and

b. joining the separable housings so that the temperature responsive resistance member is enclosed within the chamber and disposing the seating portions arranged in both the supporting engagement and the electrical contacting engagement with the temperature responsive resistance member within the chamber so that the temperature responsive resistance member is predeterminately spaced within the chamber from the housings only by the seating portions of the terminals.

4,037,317
METHOD OF MAKING FLUID OPERATED ELECTRICAL SWITCH CONSTRUCTION

Werner R. Bauer, Radnor, Pa., and Roger P. Sepso, Stratford, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 428,877, Dec. 27, 1973, Pat. No. 3,984,649. This application July 16, 1976, Ser. No. 706,069
Int. Cl.[2] H01H *11/00*
U.S. Cl. 29—622 11 Claims



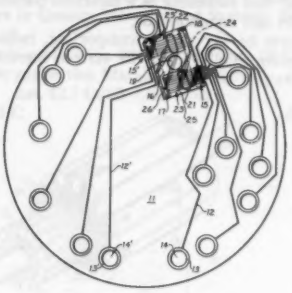
1. A method of making a fluid operated electrical switch construction comprising the steps of providing a first housing having an electrical switch therein, providing a second housing having an expandible and contractible element therein, providing a motion transmitting means that has a length adjustment means therein for adjusting the length of said motion transmitting means, assembling said housing together so that said motion transmitting means is disposed in said housings between said element and said switch to transmit movement of said element to said switch to operate the same, adjusting the length of said length adjustment means of said motion transmitting means solely by causing relative movement between said housings while said housings are assembled together but before the same are secured together, and, thereafter securing said housing together so that said length adjusting means will be at desired adjusted condition thereof.

4,037,318
METHOD OF MAKING FUSES

Harold W. Burkley, Indianapolis, and Wayne H. Geno, Noblesville, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1976, Ser. No. 735,303
Int. Cl.[2] H01H *69/02*
U.S. Cl. 29—623 6 Claims

1. A method of making fuses for a record unit comprising,
first providing on an insulated substrate an electrical circuit pattern with which a plurality of fuses are to be connected,
next providing a groove in said substarate in an area where said fuses are to be located,
next attaching each end of a plurality of fine wires to said electrical circuit pattern, said fine wires crossing said groove in said substrate,
next covering the attached ends of said fine wires with a first coating, next masking the uncovered portion of said fine wires with a flexible material, and
then encapsulating said fine wires and said first coating with a second coating whereby said flexible material prevents said second coating from individually encapsulating said

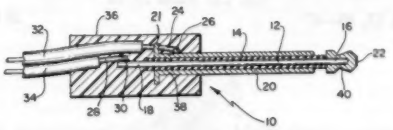


fine wires and prevents said second coating from entering said groove.

4,037,319
METHOD OF MANUFACTURE OF MALE ELECTRICAL PLUG ASSEMBLY

Robert E. Maloof, East Greenwich, R.I., assignor to Victor Electric Wire & Cable Corporation, West Warwick, R.I.

Division of Ser. No. 601,713, Aug. 4, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,112
Int. Cl.[2] H02G *15/00*
U.S. Cl. 29—629 6 Claims



1. A method of manufacturing a male electrical plug assembly comprising the steps of feeding a continuous length of conductor having an insulation applied thereto through a sleeve of predetermined length until the leading end of the conductor extends outwardly from the outermost end of said sleeve, severing the conductor at an end thereof that is external of the sleeve but adjacent to the innermost end thereof while simultaneously stripping a portion of the insulation from said conductor at the ends thereof to form exposed conductor ends, the stripped end of the conductor at the outer end thereof being spaced from said sleeve by said insulation, mounting a head pin on the exposed outer end of said conductor, connecting conductor leads to said sleeve and conductor at the inner ends thereof, and molding a body around the inner ends of said sleeve and conductor as connected to said conductor leads to encapsulate the connected conductor leads and the inner portions of said conductor, insulation and sleeve.

4,037,320
APPARATUS FOR FORMING ARMATURE WINDINGS FOR COMMUTATOR TYPE DYNAMO/ELECTRIC MACHINES

Gerard Edward Wilding, 4 The Retreat, Englefield Green, Surrey, England

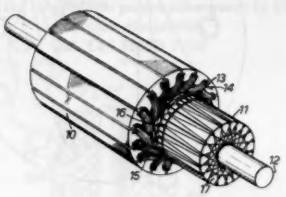
Division of Ser. No. 460,553, April 12, 1974, Pat. No. 3,942,246. This application Dec. 24, 1975, Ser. No. 644,049
Int. Cl.[2] H02K *15/09*
U.S. Cl. 29—733 28 Claims

1. Wire looping means for laying a wire in the connection slots of a commutator carried by the armature shaft of a dynamo-electric machine, said wire looping means comprising:

a drive shaft having a common axis for rotary and axial reciprocatory motion, and

at least one wire-looping arm carried at one end of said drive shaft and extending in a direction parallel to but spaced from said common axis,

said arm having a wire-transporting, radial projection extending axially along the surface thereof that is remote from said common axis,



an open-ended, wire-transporting, radial slot being formed in said arm, said radial slot being disposed beside said projection and extending axially towards said drive shaft,

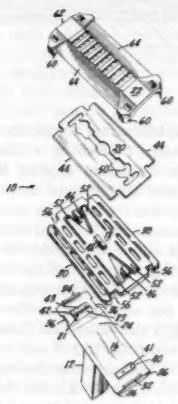
and said arm and said radial slot being dimensioned so as when in operation to extend axially over said commutator and said connection slots when said drive shaft is axially aligned with and disposed adjacent said armature shaft.

4,037,321

DOUBLE EDGE BLADE RAZOR

Clemens A. Iten, and Malcolm B. Sykes, both of Staunton, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,783
Int. Cl.[2] B26B *21/06*
U.S. Cl. 30—47 **18 Claims**



1. A razor including a handle and a shaving head assembly connected to said handle, said shaving head assembly comprising

an elongated mounting plate fixed to said handle, said mounting plate having a top surface and being disposed symmetrically of said handle,

an elongated bridge member received on the top surface of said mounting plate for sliding travel longitudinally of said mounting plate between first and second positions thereon, and vice versa, said bridge member in its first position being disposed symmetrically of said handle and in its second position having one end and a longitudinal portion thereof extending beyond one end of said mounting plate,

a razor blade member received on top of said bridge member, and

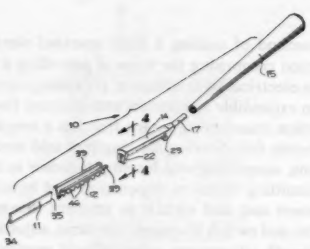
a cap member received on top of said blade member, there being cooperating means on said blade member and said bridge member and cooperating means on said cap member and said bridge member for unitarily moving said blade member and said cap member with bridge member when said bridge member is slid between its first and second positions, said cap member having downwardly depending structure girdingly engaging longitudinal marginal portions of said mounting plate when said bridge member is in said first position, the underside of said bridge member and the upper surface of said mounting plate having cooperating structure engageable when said bridge member is in said first position for urging said bridge member upwardly of said mounting plate thereby to clamp said blade member against said cap member, the cooperating structure at said bridge member underside and said mounting plate upper surface disengaging when said bridge member is slid to its second position, the downwardly depending structure on said cap member being released from engagement with the marginal portions of said mounting plate when said bridge member is moved to its second position whereby said cap member can be lifted upwardly free of said assembly to permit removal and replacement of said blade member.

4,037,322

RAZOR ADAPTED FOR SURGICAL PREPARATION

Albert E. Bresler, 14314 Chase St., Panorama City, Calif. 91402

Filed Oct. 15, 1974, Ser. No. 514,489
Int. Cl.[2] B26B *21/10, 21/12*
U.S. Cl. 30—53 **8 Claims**



6. A razor comprising a blade head, a ridigly fixed handle extending from the blade head in the plane of the blade, the head handle making an acute angle with the blade edge, walls in the blade head defining a slot adapted to removably receive a blade, head means housing the ends of the blade; means for guarding the cutting edge of the blade including a blade carrier, parallel side walls on the carrier adapted to replace the blade, means for registry of the blade in the slot, a carrier fold surrounding the blade cutting edge, and arcuate walls defining perforations in the carrier fold such that the cutting edge of the blade is discontinuous; and a razor blade residing removably in the blade head slot.

4,037,323

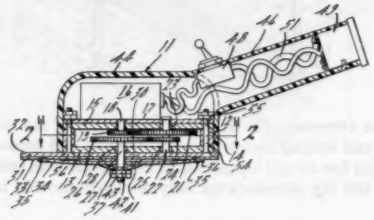
GRASS TRIMMING DEVICE

Paul F. Seibold, 26665 York Road, Huntington Woods, Mich. 48070

Continuation of Ser. No. 331,491, Feb. 12, 1973, abandoned. This application May 3, 1976, Ser. No. 682,516
Int. Cl.[2] B26B *19/14*
U.S. Cl. 30—206 **3 Claims**

1. In a hand trimmer for grass, a motor having a shaft, means driving said shaft by speed reducing means located directly adjacent to said motor, a thin, flat circular plate having an aperture through the center through which said driven shaft extends, teeth on the forward half edge portion of said plate, the rear half-edge portion of the plate having a free unbroken

edge, a blade secured at its center to said driven shaft and having a length substantially equal to the diameter of said plate, notches cut in the forward half edge portion of the plate forming said teeth, one side edge of the notches being radially disposed to form cutting edges, the other side of the notches being tangent to a circle approximately half the radius of the plate for trapping the grass when the trimmer is advanced thereinto, said blade having its centerline aligned with the center of the driven shaft with the cutting edges disposed



parallel to but offset in opposite directions therefrom each side of the driven shaft so as to produce a scissor-like cut with the radially disposed cutting edges, the single blade is driven by the motor at reduced speed so as to permit the grass to be moved into the notches between the passage of each half of the blade thereover, whereby each half of the blade cuts the grass as they advance seriatim over the notches so that only a single cut occurs to the grass within a notch at any one time thereby limiting the power requirement for the cutting operation to a minimum.

4,037,324

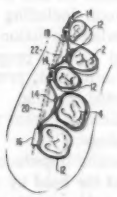
METHOD AND SYSTEM FOR ORTHODONTIC MOVING OF TEETH

George F. Andreasen, Iowa City, Iowa, assignor to The University of Iowa Research Foundation, Iowa City, Iowa

Continuation-in-part of Ser. No. 259,184, June 2, 1972, abandoned. This application May 21, 1973, Ser. No. 362,578

Int. Cl.[2] A61G 7/00

U.S. Cl. 32—14 A **19 Claims**



1. A method of moving teeth by attaching a plurality of brackets to a plurality of teeth, subjecting the brackets and the teeth connected thereto to forces which urge them toward desired positions, the latter step being performed by subjecting a wire of a near-stoichiometric alloy of nickel and titanium to torsional forces and flexural forces before attaching it to the brackets, and non-rotatably attaching the wire to the brackets so that torsional restorative forces and flexural restorative forces act upon the brackets and teeth.

4,037,325

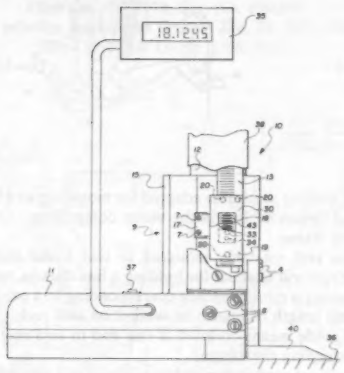
LINEAR GLASS SCALE HEIGHT GAGE

Ernest G. Weber, Fairport; John W. Balliett, Penfield; John M. Lacagnina, Henrietta, and Bruce R. Robinson, Penfield, all of N.Y., assignors to Quality Measurement Systems, Inc., Penfield, N.Y.

Continuation-in-part of Ser. No. 540,523, Jan. 13, 1975, abandoned. This application Mar. 16, 1976, Ser. No. 667,385

Int. Cl.[2] G01B 7/02, 5/02

U.S. Cl. 33—125 C **4 Claims**



1. A measurement device using Moiré fringes produced between a measurement scale and a relatively movable reader scale, said scales having respective optical rulings of different numbers of lines per unit of distance, said respective rulings being disposed generally parallel with each other, and said measurement device comprising:

a. a beam member;

b. said measurement scale being secured to said beam member to extend in a direction parallel with a surface of said beam member;

c. a carriage movable along said beam member and guided by said surface of said beam member;

d. a reader head supporting said reader scale and mounted on said carriage for movement therewith along said measurement scale in a direction parallel with said measurement scale;

e. a flexure hinge secured to said reader head and to said carriage and extending generally parallel to said measurement scale for fixing said reader head relative to said carriage against any motion in a direction parallel with said measurement scale and for allowing limited motion of said reader head in directions transverse to said measurement scale;

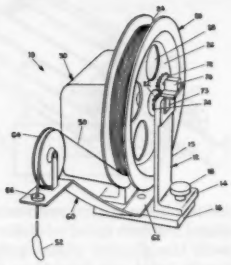
f. bearings on said reader head disposed for engaging said measurement scale and positioning said reader scale in parallel relation to said measurement scale; and

g. flexure spring means mounted on said carriage and having a free end engaging said reader head for resiliently urging said reader head toward said measurement scale to press said bearings against said measurement scale and hold said reader scale in parallel relation with said measurement scale.

4,037,326
TROLLING APPARATUS

William M. Booth, Grand Haven, and James E. Rieth, Grand Rapids, both of Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Division of Ser. No. 274,505, July 24, 1972, Pat. No. 3,916,555.
This application July 9, 1975, Ser. No. 594,500
Int. Cl.[2] G01B *3/00*; A01K *89/00*
U.S. Cl. 33—139 1 Claim



1. A trolling apparatus adapted for mounting to a boat to pay out and retrieve a line in the water comprising:

a reel frame;

a line reel rotatably mounted to said frame and having a peripheral channel for holding a line therein, said channel having a circumference corresponding to a predetermined unit length of line to be wound on said reel;

line guide means coupled at one end to said reel frame and extending therefrom;

a line anchored at one end to said reel and wound thereon in said channel, said line guidably supported by said guide means as it is extended and retracted to and from said reel;

a reversible drive motor;

means coupling said drive motor to said reel such that when said drive motor is not actuated, said reel is securely held in position to hold said line at a predetermined selected position wherein said means coupling said drive motor to said line reel comprises a plurality of gears, one of which integrally includes at least one cam detent formed on a side of said gear; and wherein said trolling apparatus includes a limit switch positioned to be actuated by said cam detent as said gear rotates and further includes remote electrically operated indication means for providing an indication of the length of line extended from said reel, said indicating means comprising an electrical counter selectively coupled to a source of actuating potential by said limit switch as said gear rotates to provide an indication of the length of line extended from said reel; and

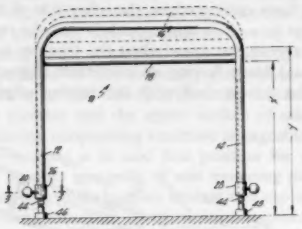
means for actuating said drive means to extend and retract said line from said reel.

4,037,327
DOG HEIGHT MEASURING WICKET

George Hildebrand, 843-a Heritage Village, Southbury, Conn. 06488

Continuation-in-part of Ser. No. 538,412, Jan. 3, 1975, Pat. No. 3,943,630. This application Mar. 16, 1976, Ser. No. 667,412
Int. Cl.[2] G01B *5/00, 5/02*
U.S. Cl. 33—169 R 1 Claim

1. A measuring wicket for dogs comprising a U-shaped member having a pair of spaced tubular legs and an interconnecting bar, a cross bar below said interconnecting bar and extending between said legs and secured thereto, leg extensions slidably telescopically received in said legs, enlarged cylindrical bosses at the bottom of said legs, indexing grooves in said extensions co-operable with said cylindrical bosses to indicate the effective height of said cross bar, locking means threadedly mounted in said legs for engagement with said extensions in said grooves selectively locking each of said leg extensions in an adjusted position, each said locking means including a spring pressed ball detent seatable in said grooves, and indicia

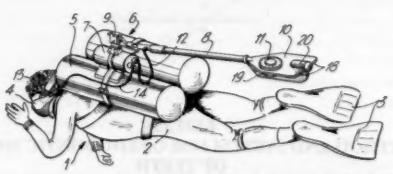


on said extensions for indicating the height of the cross bar when said locking means is seated in one of said grooves, and enlarged feet on said leg extensions engageable with said bosses when said leg extensions are fully retracted into said legs.

4,037,328
SPATIAL ORIENTATION DEVICE

Lorne Kuehn, Downsview, and Harold O. Seigel, Don Mills, both of Canada, assignors to Her Majesty the Queen in Right of Canada, Canada

Filed Oct. 7, 1976, Ser. No. 730,639
Claims priority, application Canada, June 2, 1976, 253789
Int. Cl.[2] G01C *17/30*
U.S. Cl. 33—349 9 Claims



1. A spatial orientation sytem for underwater navigation comprising:

boom means, for pivotal attachment to an underwater swimmer or diver;

compass means, mounted on said boom means adjacent an outboard end thereof, including means to develop an electrical voltage when deviation from a predetermined null axis occurs and which is proportional thereto;

adjustable means for setting said predetermined null axis so as to provide an initial heading;

an audible tone generating means receiving said proportional electrical voltage;

a pair of bone conduction transducers, adapted to be worn on opposite sides of the head by said swimmer or diver, receiving an output from said audible tone generating means;

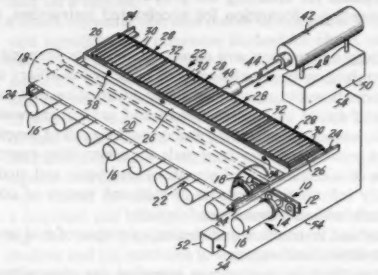
gating means connected to said output of said audible tone generating means for directing the audible tone to a selected one of said transducers corresponding to deviation in one direction and to the other said transducer corresponding to deviation in the other direction, whereby said swimmer or diver receives an audible signal indicating the magnitude and direction of any deviation from the initial heading.

4,037,329

SHUTTER AND SYSTEM EMPLOYING SAME

Sydney Johnstone Wallace, Point Roberts, Wash., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 13, 1976, Ser. No. 657,955
Int. Cl.[2] F26B *3/28;* F27D *5/00*
U.S. Cl. 34—4 15 Claims



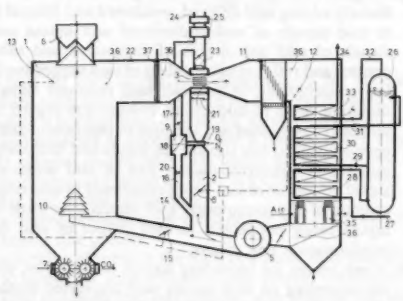
1. A shutter comprising: an elongated frame; and a plurality of individual baffle units, each of said units being comprised of a multiplicity of overlappingmutually spaced blade means disposed along the length of said unit and extending thereacross to provide a radiation barrier while permitting passage of air therebetween, headers supporting said blade means at their opposite ends, and means engaging said headers to mount said units adjacent one another along the length of said frame and accommodating thermal expansion thereof, confronting blade means of adjacent units overlapping one another to provide. a radiation barrier while permitting passage of air therebetween with said blade means extending transversely of said frame, the recited disposition and configuration of said baffle units being effective to prevent the passage of radiation through said shutter while permitting the flow of air therethrough, and the recited disposition of said blade means in combination with the recited expandable mounting of said baffle units in said frame minimizing the tendency of thermal expansion to distort said shutter.

4,037,330

METHOD AND MEANS FOR DRY COOLING BULK MATERIALS

Roland Kemmetmüller, Vienna, Austria, assignor to Waagner-Biro Aktiengesellschaft, Austria

Filed May 17, 1976, Ser. No. 687,006
Claims priority, application Austria, June 13, 1975, 4530/75
Int. Cl.[2] F26B *7/00, 21/06*
U.S. Cl. 34—20 16 Claims



1. A method for dry cooling hot bulk material within a closed system with a cooling gas, said method comprising:

a. directing a cooling gas through said bulk material to thereby cool said material and heat said cooling gas;

b. removing said heated cooling gas from said bulk material and mixing therewith a cold cooling gas;

c. cooling said mixture of heated and cold cooling gases to provided a cold stream of cooling gas; and

d.i selectively diverting a portion of said cold stream of cooling gas to the removed heating cooling gas for mixing therewith in step b; and

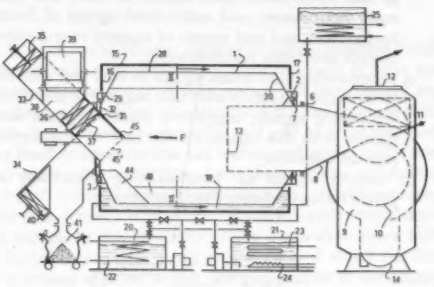
ii directing the undiverted portion of said cold stream of cooling gas to said bulk material for cooling same.

4,037,331

FREEZE-DRYING APPARATUS

Jacques Brilloit, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,000
Claims priority, application France, Jan. 22, 1975, 75.01880
Int. Cl.[2] F26B *13/30, 5/06, 5/12*
U.S. Cl. 34—92 3 Claims



1. Apparatus for the lyophilization of particles of material of the type comprising at least one sublimation enclosure rotating around a horizontal axis, said enclosure having an axial opening communicating with admission and discharge passage both downwardly inclined, said enclosure having a frusto-conical part around said opening and a cylindrical part, said frusto-conical part being fitted with substantially radial vanes extending from the immediate vicinity of said opening and having the form of a catchment through, while said cylindrical part has longitudinal vanes between which is located a series of guides, formed on one transverse side of deflecting walls substantially arranged along a helical line and on the other transverse side by radial blanking-off walls.

4,037,332

INFORMATION CONVERSION SYSTEM FOR ACCELERATED INSTRUCTION

Vyacheslav Vyacheslavovich Petrusinsky, ulitsa Malaya Jushunskaya, 8, korpus 2, kv. 51, Moscow, U.S.S.R.

Filed Aug. 4, 1975, Ser. No. 601,702
Int. Cl.[2] G09B *19/06*
U.S. Cl. 35—35 C 4 Claims

1. A method of forming and converting information for accelerated instruction with multichannel recording of said information on a carrier and simultaneous instruction of a reference student, including the steps of

a. forming, from educational aids, initial synchronized audio-visual signals of basic and auxiliary study information;

b. forming audiovisual signals of functional background to the rhythm of the student's bioprocesses;

c. forming service signals for controlling the process of reproduction of signals recorded on said signal carrier;

d. forming test signals and instruction signals;

e. working out a suggestive formula of suggestive and sub-sensor control;

f. forming, in accordance with said suggestive formula,

suggestive and subsensor control signals in the form of speech signals to the rhythm of the student's bioprocesses;

g. forming, in accordance with said suggestive and subsensor control signals, reflex reinforcement signals;

h. forming suggestive and subsensor stimulation signals;

i. registering responses and bioreactions of said reference student;

j. measuring, with reference to said test signals, the conscious perception threshold and the time of reaction of said reference student by recording his responses and bioreactions;

k. frequency-filtering said audio signals of said basic and auxiliary study information;

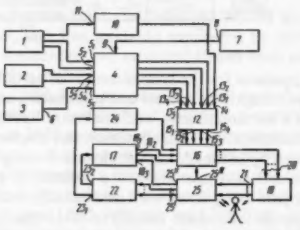
l. delaying in time, within the limits of a syntagma, said audio signals of basic and auxiliary study information;

m. changing the intensity of said delayed audio signals to the perception threshold level of said reference student, in accordance with the number of the latter's responses to said test signals;

n. linearly adding said delayed and weakened audio signals to said initial audiovisual signals of basic and auxiliary study information, said audiovisual signals of functional background, and said signals of suggestive and subsensor control and reflex reinforcement;

o. commutating said added signals in time and with respect to recording channels with said suggestive and subsensor stimulation signals, suggestive control signals, and test signals, with due regard for the time of reaction of said reference student;

p. forming signals for biostimulating electrically active points on said reference student's body;



q. synchronizing said audiovisual signals of said basic and auxiliary study information, said suggestive and subsensor control signals, and said audiovisual signals of functional background with the rhythm of physiological processes of said reference student;

r. forming - from said formed audiovisual signals of basic and auxiliary study information, said audiovisual signals of functional background, said suggestive and subsensor control signals, said reflex reinforcement signals, said test and instruction signals, said suggestive and subsensor stimulation signals, said signals delayed and weakened to the perception threshold level of said reference student, said signals synchronized with the rhythm of bioprocesses of said reference student, commutated in time and with respect to the recording channels - signals of sessions of passively assimilating information, signals of sessions of activization of passively assimilated material, signals of sessions of assimilating information and checking to the rhythm of the student's bioprocesses, signals of programmed relaxation sessions, signals of sessions of suggestively stimulating the state of said student, signals of sensomotor training sessions, signals of sessions of biostimulation of electrically active points on the body of said student, signals of suggestively controlled sleep sessions, and signals of programmed active rest sessions;

s. registering responses and bioreactions of said reference student to said formed signals of said sessions;

t. recording all said formed and converted signals on the carrier simultaneously with recording the responses and bioreactions of said reference student;

u. using said signals recorded on the carrier, as these signals are being reproduced, for accelerated instruction of students whose performance, as regards the number of responses and bioreactions to test signals, is similar to that of said reference student.

3. A system for effecting the proposed method of forming and converting information for accelerated instruction, comprising:

a. a study information unit means intended for forming synchronized audiovisual signals of basic and auxiliary study information; outputs of said study information unit means;

b. a unit means of control signals and accompaniment signals, intended for forming audiovisual signals of functional background and service signals for controlling reproduction of said audiovisual signals of said basic and auxiliary study information; outputs of said unit means of control signals and accompaniment signals;

c. a test and instruction unit means; an output of said test and instruction unit means;

d. an audiovisual unit means intended for presenting said audiovisual signals of basic and auxiliary study information, audiovisual signals of functional background, and test and instruction signals in a suggestive form; inputs and outputs of said audiovisual unit means, said inputs of said audiovisual unit means being connected to said outputs of said study information unit means, said control and accompaniment signal unit means, and said test and instruction unit means, respectively;

e. a unit means suggestive and subsensor control and reflex reinforcement of suggestive and subsensor signals, intended for forming audiovisual signals of subsensor and suggestive control from said formed suggestive formulas recorded in the form of speech signals, for forming said synchronized audiovisual signals of reflex reinforcement of said suggestive and subsensor formulas, forming said speech signals of suggestive and subsensor stimulation in the form of key speech signals; outputs of said unit means of suggestive and subsensor control and relex reinforcement of suggestive and subsensor signals; said output of said unit means of suggestive and subsensor control being connected to said input of the audiovisual unit means;

f. means for providing student responses, a delayed reinforcement unit means intended for delaying in time said speech signals of basic and auxiliary study information within the limits of a syntagma, frequency filtering these signals and weakening them to the perception threshold of said reference student, in accordance with the number of said student's responses to said test signals; an input and an output of said delayed reinforcement unit means being connected to said output of said study information unit means;

g. a signal converter means having channels, intended for linearly adding said delayed, weakened and filtered signals to said signals of said audiovisual unit means and said signals of said unit means of suggestive and subsensor control and reflex reinforcement of said suggestive formulas, commutating in time all said received signals and directing them to said channels with due regard for the number of responses and the time of reaction of said reference student to test signals; six inputs and four outputs of said signal converter means; five of said inputs of said signal converter means being connected to said respective outputs of the audiovisual unit means, the sixth of said inputs being connected to said output of said delayed reinforcement unit means;

h. a unit means for recording signals on a carrier, intended for recording on said carrier said converted signals synchronously with the rhythm of said reference student's physiological processes and his bioreactions in the course of check instruction; inputs and outputs of said unit means for recording signals on a carrier; some of said inputs of said unit means for recording signals on a carrier being

connected to said respective outputs of said signal converter means;

i. a biostimulation unit means intended for stimulating electrically active points on said reference student's body; inputs and outputs of said biostimulation unit means; said outputs of said biostimulation unit means being connected to respective inputs of said unit means for recording signals on a carrier;

j. a check reproduction unit means intended for transmitting said signals to said reference student for check instruction and for instructing students whose performance, as regards the reactions to said test signals, is similar to that of said reference student; a multichannel input and an output of said reproduction unit means; said multichannel input of said reproduction unit means being connected to the multichannel output of said unit means for recording signals on a carrier, whereas output audiovisual signals are reproduced for said reference student;

k. a response and biosignal unit means intended for registering the basic physiological processes of said reference student and his reactions to signals of said check reproduction unit means; inputs and outputs of said response and biosignal unit means; one of said outputs of said response and biosignal unit means being connected to said input of said biostimulation unit means;

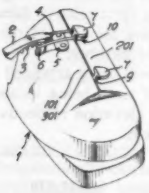
l. a sensor unit means intended for picking up bioinformation from said reference student and transmitting stimulating signals to said reference student; inputs and outputs of said sensor unit means; some of said outputs being connected to said inputs of said response and biosignal unit means, one of the other outputs being connected to said input of said biostimulation unit means, a third output being connected to the input of said unit means for recording signals on a carrier, the inputs of said sensor unit means being connected to the outputs of said check reproduction unit means.

4,037,333

LACING DEVICE FOR SKI BOOTS

Icaro Olivieri, 10, Via Feltrina Nord, Montebelluna, Italy (31044)

Filed Aug. 24, 1976, Ser. No. 717,289
Claims priority, application Italy, Sept. 18, 1975, 12795/75
Int. Cl.² A43B *5/04, 11/00*; A43C *11/00*
U.S. Cl. 36—117 **8 Claims**



1. In a ski boot of the type comprising a ski boot upper provided with two flaps defining an opening, a lacing device including a hooked lever-like lacing member provided on one flap and intended to cooperate with a flexible elastic ring-like lacing member on the other flap, means for securing said flexible elastic ring-like lacing member in a removable manner onto its flap, said means comprising:

a. a shaped projection provided on the flap and presenting at least a side groove;

b. a locking element in the form of a small plate shaped so as to present at least a channel-like portion capable of slidably engaging the said groove provided on the shaped projection, so as to define, upon engagement with the said groove, a tubular channel for housing a portion of the said ring-like lacing member;

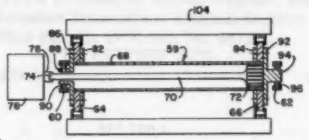
c. at least an anchoring member provided on said locking element, capable of engaging a portion of the flap in order to secure the locking element in the position in which its channel-like portion engages the groove provided on the shaped projection.

4,037,334

DRIVE MEANS FOR AN ELEVATING SCRAPER ELEVATOR

Robert Antone Plemitscher, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 21, 1976, Ser. No. 688,673
Int. Cl.² B60P *1/36*
U.S. Cl. 37—8 **3 Claims**



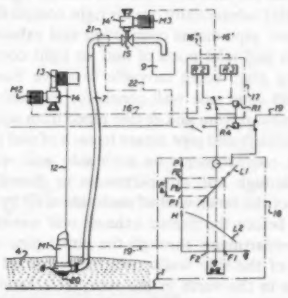
1. In an elevating scraper elevator of a type including a main frame rotatably supporting at least one pair each of drive and idler sprockets at longitudinally spaced locations thereof and an endless conveyor trained about the drive and driven sprockets, the improvement comprising: said pair of drive sprockets being fixed to opposite first and second end portions of a relatively torsionally stiff hollow drive shaft section; said hollow drive shaft section having its opposite ends rotatably mounted on the main frame; a relatively torsionally flexible second drive shaft section located centrally within the hollow drive shaft and having opposite first and second ends of which the first end is located adjacent to the first end portion of the hollow drive shaft and the second end **16** located adjacent to and is fixed to the second end portion of the hollow drive shaft and forms the sole connection between the first and second drive shaft sections; and drive input means mounted on the main frame and drivingly coupled to the first end of the second drive shaft section.

4,037,335

METHOD OF CONTROLLING A MOBILE SUCTION DEVICE FOR SUCKING SUSPENDIBLE MATERIAL FROM THE BOTTOM OF A LIQUID BODY, AND AN APPARATUS FOR CARRYING OUT THE METHOD

Nils Arne Sandberg, Hassleholm, Sweden, assignor to Ingenjorsfirman N.A. Sandbergs Industrikonstruktioner AB, Hassleholm, Sweden

Filed May 5, 1975, Ser. No. 574,280
Claims priority, application Sweden, Aug. 29, 1974, 7410937
Int. Cl.² E02F *3/88*
U.S. Cl. 37—58 **9 Claims**



1. A method of controlling a suction device used for sucking

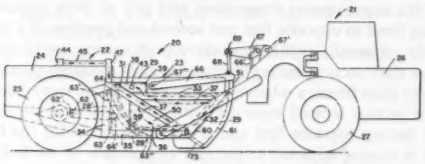
material suspendible in fluid, especially sedimented material, from the bottom of a liquid body, said device being movable along at least one axis including at least one suction nozzle, means for producing suction in the nozzle, and means for supporting and moving said nozzle in relation to said material for sucking material and fluid as a suspension, wherein variations under and above predetermined limits of at least one magnitude which is characteristic of the operation of the suction device and which varies in response to the rate of flow through the nozzle, are sensed and used as signals for controlling a movement of the nozzle along at least one horizontal axis.

4,037,336

SCRAPER DEVICE HAVING RECEPTACLE WALLS HEATED BY ENGINE EXHAUST

Robert D. Benson, Arvilla, N. Dak. 58214

Filed Mar. 15, 1976, Ser. No. 666,608
Int. Cl.[2] E02F *3/06*
U.S. Cl. 37—124 **1 Claim**



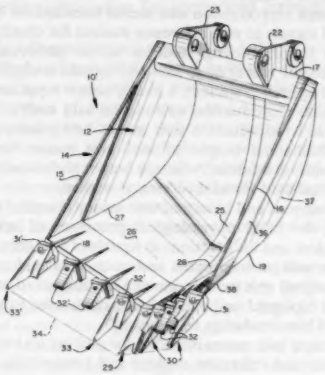
1. A scraper device comprising a front and rear frame, an engine fixed on said rear frame, an elongated receptacle fixed on said rear frame in front of said engine, said engine having an exhaust outlet, said receptacle having side walls, a back wall, a cover plate to cover the front of said receptacle, and an unloading plate movably mounted within said receptacle for unloading earth from within said receptacle, said side walls each having a vertical inner panel having smooth inner surfaces, lateral rib members mounted to the outside of said inner panel to form outward extending ridges, outer panel means parallel to said inner panel means and spaced outwardly therefrom and connecting said ribs together at their outer edges to form substantially one air tight compartment on each side wall, said substantially one air tight compartment on each side wall covering a major portion of the area of each inner side wall, said substantially one air tight compartment having an inlet port, said ribs having ports to provide communication throughout the interior of each of said air tight compartments, each of said substantially one air tight compartments having an outlet port, pipe means connecting said exhaust outlet of said engine to said inlet ports of said air tight compartments, said unloading plate being movable to move from rear to front along said inner side wall panels for said unloading whereby heated exhaust from said engine piped from said engine exhaust outlet through said pipe means to each of said substantially one air tight compartments on each side wall will be caused to travel through said compartments to directly heat a major portion of the inner wall of each side wall by the heat of said exhaust before the heated exhaust will travel out of said air tight compartments through the outlet pipe to keep a major portion of the side walls sufficiently heated to prevent any moisture in the earth in the receptacle located between the unloading plate and the inner side walls from freezing and locking the unloading plate to the inner side wall panels during sub zero weather.

4,037,337

EXCAVATING BUCKET AND TEETH FOR A BACKHOE

Charles Wayne Hemphill, Duncanville, Tex., assignor to ADCO Buckets, Inc., Dallas, Tex.

Filed Aug. 18, 1976, Ser. No. 715,560
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 R **16 Claims**



1. An excavating bucket mount means by which said bucket can be attached to a backhoe, said bucket having a bottom member comprised of two opposed sloped members which slope downwardly towards one another; a rear wall; spaced sides joined to said bottom member and rear wall to form an outwardly opening enclosure;

said sloped members having a leading edge spaced from said rear wall;

a plurality of digging teeth, each tooth having a shank by which it is mounted to one of said opposed sloped members, the teeth mounted to one said sloped member being mirror images of the teeth mounted to the opposed said sloped member;

each tooth having a pilot member and an asymetrically arranged secondary digging member, said pilot member is projected forwardly of said asymetrically arranged secondary digging member, with the secondary digging member of the teeth on one said sloped member all being orientated in the same relative direction respective to the secondary digging member of the teeth located on the remaining sloped member;

said plurality of teeth being arranged in opposing pairs with an outer pair of teeth being located fowardly, laterally, and at a higher elevation respective to the next adjacent inner pair of teeth.

4,037,338

VACUUM BELT FILTERS

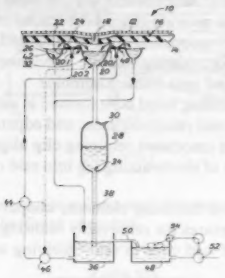
Sylvain Dominique Daniel Léonce Berline, 45 Rue du Belvedere, Mareil-Marly, Yvelines, France

Filed Dec. 22, 1975, Ser. No. 643,060
Claims priority, application France, Dec. 26, 1974, 74.42864; Apr. 30, 1975, 75.13626
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—77 **9 Claims**

1. A suction box for a vacuum belt filter having a belt whereon material is carried that is to be filtered by means of a suction force exerted via the suction box and which travels over the suction box, the suction box including a conduit fast with the suction box along each edge thereof parallel to the direction of travel of the belt, each conduit having an inner and an outer wall and an inlet opening through which a pressurized support fluid may be introduced into the conduit to provide a support cushion for the belt, and the inner wall of each conduit being of a resiliently deformable material and having a longitu-

dinal cavity and an opening through which a pressurizing fluid may be forced into the cavity to pressurize it so that the conduits deform, in use, according to the shape of the belt.

7. A method of operating a vacuum belt filter having a belt whereon material is carried that is to be filtered by means of a suction force exerted via a suction box located below the belt



over which the belt travels, which includes supporting the belt on a cushion of the filtrate by forcing a part of the filtrate between support members, located along each edge of the support box, parallel to the direction of travel of the belt, and the belt; collecting the filtrate that flows out between the belt and the support members; and re-cycling the collected filtrate to form the support cushion.

4,037,339

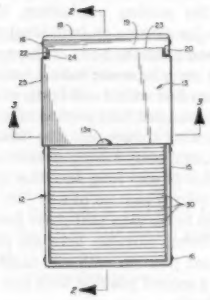
VISIBLE FILE-CARD SYSTEM

Jerome M. Romick, 2008 Zettler Road, Columbus, Ohio 43227

Filed Sept. 2, 1976, Ser. No. 719,938

Int. Cl.² B42F *15/00*

U.S. Cl. 40—104.12 **7 Claims**



1. A visible file-card assembly comprising a holder including a back panel with a longitudinally-extending recess formed therein to provide parallel spaced longitudinally-extending depending flanges of substantial depth and longitudinally-extending card-support surfaces at each side thereof, said flanges having pairs of aligned inwardly-opening pivot socket openings formed therein at longitudinally-spaced intervals; and cards adapted to be mounted on the holder, said cards being of flexible material, a tab projecting upwardly from the upper edge of each card and of slightly less lateral extent than the spacing of said recess flanges so that it can be inserted in the recess between the flanges and so located laterally on the card as to provide laterally-disposed card surfaces which will rest on the flat card support surfaces at each side of the recess, a resilient pivot strip secured to the tab at laterally spaced points so there is an unsecured portion therebetween to permit insertion of the finger between the strip and tab for flexing, said pivot strip having pivtos projecting from the opposed ends thereof beyond the respective end of the tab, flexing and bowing of the pivot strip by insertion of the finger between it and the tab contracting the strip to shorten the overall length of the strip with its pivots to permit insertion of the strip on the tab into the holder recess to align the pivots therof with a pair of said pivot socket openings and withdrawal of the finger permitting extension of the strip so that the pivots thereof will project into the opposed openings of the pair to pivot the card to the holder and permit it to rest on said card support surface at each side of the recess and removal of the card by inserting the finger to flex and bow the strip to withdraw the pivots from said socket openings.

4,037,340

SCARF

Alan Sidney Lewis Owensmith, Epsom, England, assignor to Merchant Inventors International Limited, England

Filed Feb. 10, 1976, Ser. No. 657,382

Int. Cl.² G09F *7/00*

U.S. Cl. 40—129 A **6 Claims**

1. A scarf for wearing about the neck, said scarf being generally rectangular and having a length substantially greater than its width, each of the opposed end sections of the scarf having at least one hand-receiving pocket having an open end facing a longitudinal edge of the scarf and having an opposite closed end, said pockets together providing bearing places against which hand pressure can be exerted towards the scarf ends, the spacing of such bearing places along the scarf being such that a user can let his hands bear against such places while the scarf is being worn, draped around his neck, and can then by raising his arms and moving his hands away from each other, bring the scarf into a display position in which the part of the scarf between said places is stretched taut above the user's head with the opposed surfaces of the scarf facing to the front and rear of the user, and wherein that part of the scarf bears readable matter which is legibly displayed when the scarf is in such display position.

4,037,341

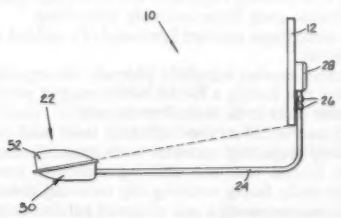
LUMINAIRE FOR LIGHTING A SIGN AND METHOD

Herbert Arnold Odle; Daryl Dean Sullivan, and Kurt Franck, all of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Aug. 13, 1973, Ser. No. 387,879

Int. Cl.² G09F *13/00*

U.S. Cl. 40—130 B **14 Claims**



1. A lighting arrangement comprising:

a. a rectangular sign located in a fixed position and including

a top edge portion, a bottom edge portion and opposite side edge portions; and

b. a luminaire including

i. a light opaque luminaire support comprising a front section having a flat top edge, and side sections located at opposite ends of said front section and extending rearwardly therefrom, each of said side sections including a flat top edge which extends from an associated end of said front section and wherein all of said flat top edges lie in a common plane, said front and side sections extending from said plane into a first area to one side of said plane.

ii. a light source disposed between the said side sections and rearwardly of said front section and in said common plane,

iii. a reflector having a reflective surface, said surface being positioned between said side sections and extending from above said source around the back side of said source and under and forward thereof, said surface including a top rear section located behind and above said source for directing light from said source towards a specific one of said edge portions and a bottom front section located in front of said source for directing light from said source towards a segment of said sign including an opposite edge portion thereof, said segment being to one side of said specific edge portion, and

iv. means for supporting said light source and reflector with said support;

c. means for locating said luminaire in a predetermined position in front of said sign such that

i. said specific one edge portion of said sign lies in said common plane with the remainder of said sign being located in a second area on the opposite side of said plane as said first area, and

ii. said front and side sections of said opaque luminaire support prevent specific direct light from said source from escaping said luminaire, said specific light being direct light which would otherwise pass into said first area and beyond said one edge portion of said sign.

4,037,342

LICENSE PLATE HOLDER

John A. Bott, 931 Lakeshore Drive, Grosse Pointe Shores, Mich. 48236

Filed Feb. 2, 1976, Ser. No. 654,464
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—209 **1 Claim**

1. A license plate frame assembly comprising,

a one-piece frame member fabricated of a molded polymeric material,

said frame member being of a generally rectangular configuration and having a frontal wall arranged parallel to the license plate to be assembled thereto,

said frame member also including inner and outer rearwardly projecting enclosure walls integrally connected to said frontal wall and defining therewith spaced apart rearwardly facing retaining clip receiving areas,

said areas comprising a pair of spaced parallel slots arranged at generally 90° to the plane of the license plate and located on opposite parallel edges of said frame member,

a pair of retaining clips associated one with each of said areas and each including a resilient arm section adapted for engagement with a rearward side of the license plate and a retaining leg section arranged at generally right angles to the associated resilient arm section and adapted to be nestingly received in one of the receiving areas,

said retaining leg sections each having an aperture therein,

means formed integrally of said retaining clips comprising folded corners of said resilient arm sections of said retaining clips which provide sharp projections extending from the plane of the associated clips and adpated to engage the license plate for resisting relative movement between the license plate and said frame assembly,

an inwardly extending blind bore formed in said frame member at each of said receiving areas and adpated to have the aperture of the associated retaining clip aligned therewith upon insertion of the retaining leg into said receiving area, and

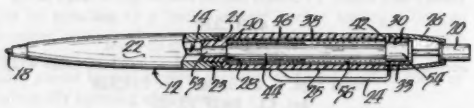
a pair of threaded fastening elements cooperable with said bores and apertures for removably securing said retaining leg sections of said clips in said receiving areas.

4,037,343

NOVELTY WRITING INSTRUMENT HAVING AN APPEARING AND DISAPPEARING PERSONAL NAME

Victor Lonsmin, 1406 Ogden, LaGrange, Ill. 60525

Filed Feb. 19, 1976, Ser. No. 659,262
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—334 **19 Claims**



1. In a writing instrument having a writing mechanism and a body containing the writing mechanism, the improvement comprising means for causing an individual person's name to appear and disappear from the body of the writing instrument, and including film carrying name indicia juxtaposed said body and slide means movable within said body, at least a portion of said body being transparent, said portion of said film providing said name indicia being transparent, the other portion of said film being-opaque, said body having an interior the same color as said other portion of said film, said interior being viewable through said transparent portion of said film, said slide means being of a different color than said other portion of said film, said slide means being movable between said film and said interior between one position with said name indicia apparent on said body and a second position with said name indicia not apparent on said body.

4,037,344

MAGNETIC CARTRIDGE CHAMBERING AND BOLT HOLDING SYSTEM

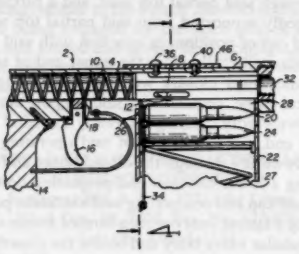
Frederick P. Reed, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,061
Int. Cl.[2] F41C *13/00*
U.S. Cl. 42—16 **11 Claims**

1. In a firearm assembly having a receiver housing, a reciprocable bolt, a firing chamber in said receiver housing, and an ammunition cartridge feed inlet communicating with said receiver housing for positioning of each cartridge in a guide station in the receiver housing for subsequent linear movement of the cartridge by the bolt into the firing chamber, the improvement comprising:

magnetic means carried by said receiver for magnetically

guiding movement of each cartridge through said inlet to said guide station and for holding each of said cartridges



in said station for subsequent movement thereof by the bolt into the firing chamber.

4,037,345

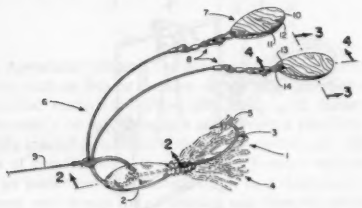
FISHING LURE BLADE

Eugene Dubois, 1057 Sunshine, Baker, La. 70714

Continuation-in-part of Ser. No. 567,526, April 14, 1975. This application Feb. 9, 1976, Ser. No. 656,154

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.13 **1 Claim**



1. In a fishing lure used in water having a body means, a hook assembly attached to one end of said body means, a guard assembly attached to said body means' other end, the improvement to which comprises a blade attached to said guard assembly, said blade being constructed from material having a density sufficiently small to cause said blade's density to be less than said water's density, said blade being attached to said guard assembly by a swivel assembly, said blade comprises a body section having an oblong shape formed by a concave surface adjacent to a flat surface, said body section having one end narrower than the other, said swivel assembly connecting to said narrow end.

4,037,346

TUBE FLY, AND METHOD FOR ITS PRODUCTION

Johan Wilhelm Isaachsen Holst, Lybekkveien 39 A, Oslo 3, Norway

Filed Feb. 20, 1976, Ser. No. 659,851

Claims priority, application Norway, Feb. 20, 1975, 750583

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.14 **28 Claims**

1. A tube fly for use in fly fishing with a fly rod and a fly line having a hook and a bead bearing at the end thereof, said tube fly comprising:

a tube shaped body having an inner diameter dimensioned to form means for receiving therethrough a fly line such that said tube body freely rotates directly about such fly line in front of a hook and a bead bearing;

at least one set of thin-walled fins bonded to said tube body, the fins of said at least one fin set being inclined at an angle to the axis of said tube body, said at least one fin set comprising means to cause spinning of said tube body about the fly line without substantial twisting of the fly line when the assembled fly is pulled through the water; and the weight of said tube fly not exceeding 1.5 g.

4,037,347

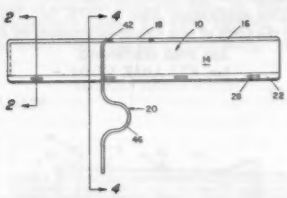
FISHING BAIT HOLDER

Kenneth L. Deal, R.R. No. 1, Palo, Iowa 52324

Filed Mar. 12, 1976, Ser. No. 666,435

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—4 **2 Claims**



1. A fishing bait holder comprising a pair of confronting generally parallel grippers each having a longitudinally extending top edge and a longitudinally extending lower edge generally parallel to said top edge, the top edge and lower edge of each of said grippers being joined by an outwardly curved central portion, a plurality of links formed at spaced intervals along the lower edge portions of said grippers and a single hinge pin extending through said links along substantially the entire length of the holder to pivotally join said grippers, a generally upwardly extending lip along the top edge of each of said grippers which lips engage one another when said holder is closed, said central portions of said grippers forming a narrow longitudinally extending trough for the reception of bait, an end member at one end of each of said grippers which end members partially enclose said trough when said holder is closed with said lips engaged, and a downwardly extending handle connected at its upper end to said grippers near the top edges thereof, said handle being formed of resilient material so as to normally bias the holder to an open position with said lips separated.

4,037,348

FISH LURE

Joachim Kruger, Schillerstrasse 8, D-49 Herford, Germany

Filed Mar. 12, 1976, Ser. No. 666,436

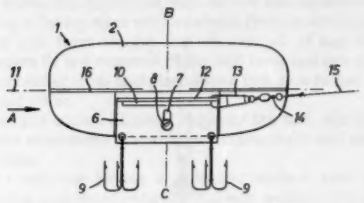
Claims priority, application Germany, Mar. 15, 1975, 2511414

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.23 **4 Claims**

1. An imitation fish lure for use with a rod and line for catching predatory fish comprising a wing shaped swimming body curved symmetrically about a transverse median line to present an outwardly curved face to one side of said swimming body and for imitating a fish swimming transversely to said line

when pulled thereby, a bar parallel to a longitudinal axis of said swimming body, arranged, on said outwardly curved face of said swimming body and arranged below said longitudinal axis of said swimming body when said swimming body is pulled by said line, fastening means for slidable attachment of said line to



said bar, adjusting means for adjusting said bar at right angles to said longitudinal axis of said swimming body and a stabilizing edge defined by said outwardly curved face of said swimming body covering said bar and extending to opposite extremities of said swimming body.

4,037,349

MINNOW BUCKET WITH WATER AERATING MEANS

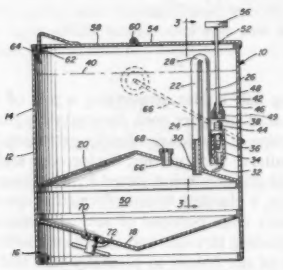
James A. Key, 812 Hanover, Weatherford, Tex. 76086

Continuation-in-part of Ser. No. 547,748, Feb. 6, 1975, Pat. No. 3,972,145. This application June 4, 1976, Ser. No. 693,118

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.[2] A01K *97/04*

U.S. Cl. 43—57 **6 Claims**



1. A minnow bucket with water aerating means, said bucket including peripherally continuous upstanding side wall portions, rigid upper and lower vertically spaced closure walls extending and sealingly secured across the lower end portions of said side wall portions and defining an upwardly opening water receptacle above said upper closure wall and a closed airtight chamber between said closure walls, air passage means opening through said upper closure wall, including an inlet end open to said chamber and an upwardly opening outlet end above said upper closure wall, a tubular valve body supported within said outlet end, a valve element shiftably supported centrally within said valve body for movement between lower and upper open and closed limit positions, respectively, a support member threadedly engaged with the upper end of said body and including an abutment portion engageable with said valve element upon downward threading of said support member on said body to variably downwardly displace said element away from its closed limit position toward its open limit position for variably controlling the venting of air from said airtight chamber through said tubular valve body into said receptacle and aerating the water therein, means operative to introduce air under pressure into said chamber, a stationary partial top wall secured over one side portion of the upper end of said bucket in vertical registry with said valve body, said support member being carried by the lower end of a substantially vertical operating rod whose upper end is rotatably received through said partial top wall, and a further top wall portion hingedly supported from said partial top wall swingable into and out of position, in coaction with said partial top wall, to substantially fully close the upper end of said bucket, said upper and lower closure walls being of upright and inverted conical shape, respectively, said support member comprising a downwardly opening internally threaded cap closed at its upper end, the lower end of said operating rod being secured downwardly through the closed upper end of said cap and including a lower terminal end projecting down into the interior of said cap and comprising said abutment portion, said cap including a lateral vent opening formed in one side thereof above said tubular valve body and below the closed upper end of said cap.

4,037,350

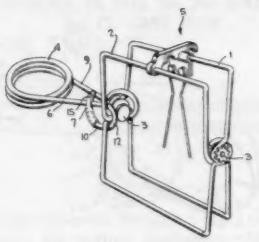
SAFETY RELEASE FOR ANIMAL TRAP

Anthony J. Souza, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Mar. 12, 1976, Ser. No. 666,505

Int. Cl.[2] A01M *23/26*

U.S. Cl. 43—90 **5 Claims**



1. A trap comprising two similar frame-shaped jaws, each of said jaws having opposite frame ends, pivot means pivotally connecting said frame ends of one of said jaws to the respective frame ends of the other of said jaws intermediate said frame sides for pivoting said frame-shaped jaws about a common pivot axis between a sprung position in which the opposite frame sides of one jaw are in adjacent relation with the respective frame sides of said other jaw, and a set position in which the respective frame sides of the two jaws are in opposite adjacent relation, spring means comprising a coil spring member with two projecting arms each of which terminates in a ring member which slidably engages around a respective pair of pitvotally connected frame ends for biasing said frame-shaped jaws around said pivot means from said set position to said sprung condition; one of said ring members which terminates a projecting arm of the spring being a closed ring and the other of said ring members being an open ring with its opening being sufficient to permit passage of said frame side there through, the open end of said ring member engaging one end of an elongated tubular sleeve, the other end of which is slotted on opposing sides in a direction longitudinal to the axis of the tubular member to engage transversely the arm of the spring on which said open ring is disposed and locking means at the slotted end of said tubular sleeve to maintain said arm and sleeve in engagement, and a trigger means extending between said frame-shaped jaws for releasing said frames from the set to the sprung position when releasing pressure is applied to said trigger means.

4. Easily releasible safety keeper means for a trap of the rotating frame type having spring means comprising projecting arms, each arm having a terminal ring slidingly engaging the frames of the trap, one of said rings being partially open; said keeper means comprising an elongated tubular sleeve

having a curvature approximately equal to that of said ring, one end of said sleeve being slotted on opposing sides in a direction longitudinal to the axis of the sleeve, the other end of said sleeve being engaged by the open end of said partially open ring, said slotted end of said sleeve engaging transversely the arm of said spring, and means to releaseably lock said keeper means to said arm.

4,037,351

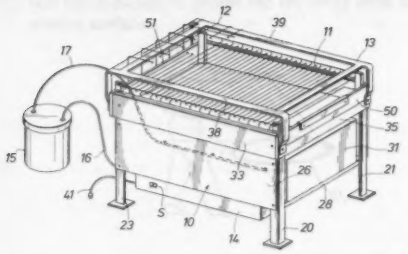
APPARATUS FOR ATTRACTING AND ELECTROCUTING FLIES

Charles H. Springer, Rte. 1, Box 327, Alta Loma, Tex. 77510

Filed Dec. 15, 1975, Ser. No. 640,476

Int. Cl.[2] A01M *1/22*

U.S. Cl. 43—112 **11 Claims**



1. Apparatus adapted for use in attracting and electrocuting insects such as flies or the like, comprising: an open-topped but otherwise enclosed hollow structure; grid means mounted horizontally on said structure and having a plurality of pairs of closely spaced conductors; means for electrically charging said pairs of conductors to a potential difference sufficient to subject an insect passing therethrough to a destructive electrical current; and means for producing and then, by positive pumping pressure, releasing in a region below said grid means a dry odor that is effective to attract an insect to pass through said grid means.

4,037,352

ELECTRICAL DEVICE WHICH EMITS INSECTICIDAL VAPORS

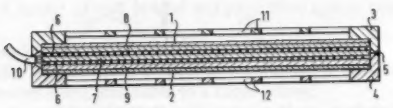
Claude Hennart, Le Clos Baron a Seraincourt, and Rene Blanc, Poitiers, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Continuation of Ser. No. 634,580, Nov. 24, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,027

Claims priority, application Luxembourg, Sept. 5, 1975, 73337

Int. Cl.[2] A01M *19/00*

U.S. Cl. 43—129 **17 Claims**



1. A device destined for the emission of vapours of an active substance, in particular an insecticidal substance, which comprises, in a rigid assembly,

a. a reservoir containing the active substance and having an evaporation surface for the emission of the active vapours, said reservoir comprising

i. a system of two plates of a porous fibrous material, one of the large faces of one of the plates facing one of the large faces of the other, and a frame for the plates, which separates the space between the two plates from the exterior whilst leaving entirely or partially free at least one of the two large external faces of the two plates, which can thus serve as an evaporation surface, and

ii. an insecticidal pyrethrinoid substance having a vapour pressure, at 25° C, of between 1×10^{-6} and 2×10^{-4} mbar, said two plates being impregnated, with said substance or substances, the total evaporation surface of the two plates being at least 10 cm^2, the amount of active substance in said reservoir being sufficient to give effective evaporation, at 90° C for a period of at least 10 hours, and the thickness of the plates being sufficient to absorb the said amount of active substance,

b. an electrical resistance associated with the said reservoir in such a way as to heat at least the part of the said reservoir which comprises, or is close to, the said evaporation surface, said resistance being enclosed within the said system and being so constructed as to heat the large internal faces of the two plates to a temperature of up to 90° C, and

c. a system for connecting the resistance to a source of electric current.

4,037,353

DEVICE FOR EMITTING VAPORS OF ACTIVE SUBSTANCE

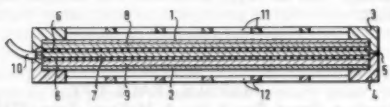
Claude Hennart, Le Clos Baron a Seraincourt; Marcel Dulat, and René Blanc, both of Poitiers, all of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Continuation of Ser. No. 634,379, Nov. 24, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,028

Claims priority, application Luxembourg, Nov. 27, 1974, 71378

Int. Cl.[2] A01M *19/00*

U.S. Cl. 43—129 **17 Claims**



1. A device destined for the emission of active vapours of an active substance, in particular an insecticidal substance, which comprises, in a rigid assembly,

a. a reservoir containing the active substance and having an evaporation surface for the emission of the active vapours, said reservoir comprising

i. a system of two plates of a porous or fibrous material, one of the large faces of one of the plates facing one of the large faces of the other, and a frame for the plates, which separates the space between the two plates from the exterior whilst leaving entirely or partially free at least one of the two large external faces of the two plates, which can thus serve as an evaporation surface, and

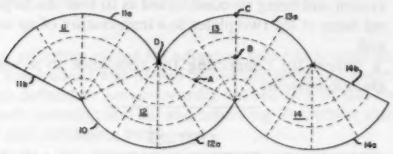
ii. an insecticidal organo-phosphorus substance having a vapour pressure, at 25° C, of between 5×10^{-5} and 5×10^{-3} mbar, with or without addition of a pyrethrinoid insecticidal compound having a vapour pressure, at 25° C, of between 1×10^{-6} and 2×10^{-4} mbar, said two plates being impregnated, with said substance or substances, the total evaporation surface of the two plates being at least 20 cm^2, the amount of active substance in said reservoir being sufficient to give effective evaporation, at 85° C for a period of at least 10 hours, and the thickness of the plates being sufficient to absorb the said amount of active substance,

b. an electrical resistance associated with the said reservoir in such a way as to heat at least the part of the said reservoir which comprises, or is close to, the said evaporation surface, said resistance being enclosed within the said system and being so constructed as to heat the large inter-

nal faces of the two plates to a temperature of up to 85° C, and

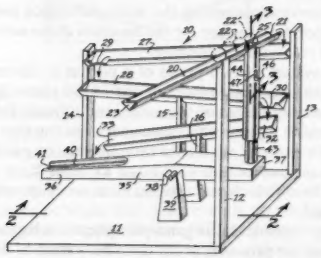
c. a system for connecting the resistance to a source of electric current.

4,037,354
EDUCATIONAL AND TOPOLOGICAL TOYS, PACKAGING, KEY, JEWEL, FLOATING GEAR, ARCHITECTURE AND GEODESICS, SPACE MECHANICS AND VISUAL EYE THERAPY DEVICES
ChaBakKuk, New Brighton, Beaver County, Pa. 15066
Filed Feb. 24, 1975, Ser. No. 552,643
Int. Cl.² A63H *33/06*
U.S. Cl. 46—1 L **6 Claims**



1. A toy, packaging, key, jewel, floating gear and architectural geodesic device having a constant center of gravity and at least one continuous substantially curvilinear surface comprising a three dimensional package whose outer surfaces are defined by wrapping a flat sheet cut selectively from an even number of connected arcuate segments of one kind formed into conical segments, mixed arcuate segments of two kinds formed into conical segments, arcuate segments of one kind formed into conical segments mixed with an even number of rectangular segments formed into cylindrical segments into a closed package with all edges in contact with another edge of the sheet.

4,037,355
MARBLE TRACK TOY
Bonnie A. Street, Rte. 2, Box 8, McEwen, Tenn. 37101
Filed Aug. 19, 1976, Ser. No. 715,872
Int. Cl.² A63H *33/00*
U.S. Cl. 46—43 **7 Claims**



1. A marble track toy comprising:

a. a base,

b. a declining magazine trough mounted on said base for supporting a plurality of rolling objects.

c. a seat opening in said magazine trough for receiving by gravity one of said rolling objects in a stationary position,

d. declining track means on said base below said seat opening having a lower end, and along which said rolling objects are adapted to roll,

e. said track means being adapted to receive a rolling object released from said seat opening,

f. a teeter arm having first and second end portions,

g. fulcrum means mounting said teeter arm on said base to pivot about a horizontal transverse axis between said end portions, said first end portion being vertically below the lower end of said track means,

h. plunger means operatively associated with said second end portion and cooperative with said seat opening to release a rolling object from said seat opening to cause said object to roll toward and upon said track means when another rolling object drops from the lower end of said track means upon the first end portion of said teeter arm.

4,037,356
SPINNING HOOP
Gilbert S. Chantland, R.R. No. 1, Tama, Iowa 52339
Filed Sept. 15, 1975, Ser. No. 613,468
Int. Cl.² A63H *1/32*
U.S. Cl. 46—47 **3 Claims**

1. A spinning hoop, comprising,

a circular hoop element,

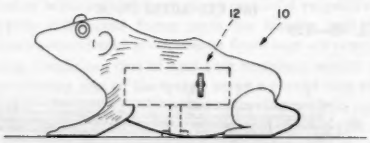
a swivel means secured to said hoop element at a point along the circumference thereof, and

a supporting cord for hand manipulation secured to said swivel means so that said hoop may be spun and moved relative to said cord without imparting substantial twisting of said cord,

said hoop being a hollow tube,

and an elongated metal ballast element extending through a substantial portion of the length of the interior of said hollow tube.

4,037,357
JUMPING TOY
Henry T. Monroe, and William H. Peebles, Jr., both of 35 N. 63rd St., Philadelphia, Pa. 19139
Filed Apr. 9, 1976, Ser. No. 675,349
Int. Cl.² A63H *11/06*
U.S. Cl. 46—129 **6 Claims**



1. A jumping toy comprising, in combination:

a base member having side walls and a bottom wall and a simulated animal or insect mounted thereon;

a first shaft mounted rotatably in said base member;

a coil spring mounted upon said first shaft and adapted to be wound thereon;

a gear train operatively connected to said coil spring and including a sector gear;

said bottom wall of said base member having an aperture therein;

a thrust spring-biased thrust rod mounted for vertical oscillation within said base member in vertical alignment with said aperture;

a movable shaft mounted within said base member for oscil-

lation together with said thrust rod; first gear means carried by said movable shaft engageable with and drivable by said sector gear;

a gear rack mounted fixedly within said base member;

and second gear means carried by said movable shaft maintained in meshing engagement with said gear rack;

whereby upon winding of said coil spring and activation of same said sector gear drives said gear means and effects rotation of the movable shaft and the climbing of said gear rack by said second gear means against the spring bias, the cyclical engagement and disengagement of said sector gear and first gear means of said movable shaft causing cyclical oscillation of said thrust rod and the periodic development of a force against a supporting surface for said toy sufficient to propel the toy away from said supporting surface.

4,037,358

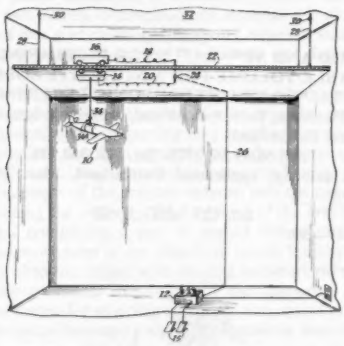
MODEL AIRPLANE DRIVE AND CONTROL SYSTEM

Phillip Rosenbaum, 113 Nurmi, Fort Lauderdale, Fla. 33301

Filed Oct. 31, 1975, Ser. No. 627,522

Int. Cl.² A63H *30/02*

U.S. Cl. 46—253 **6 Claims**



1. A model aircraft control and propulsion system comprising:

a model aircraft;

means for providing a pathway for moving a vehicle, said means being attachable to a room ceiling;

a vehicle moveably coupled to said ceiling vehicle support means;

tethering means connected to said moveable vehicle and said aircraft;

means for controlling the movement of said vehicle;

power supply connected to said means for controlling movement of said vehicle;

motor means for propelling said vehicle connected to said vehicle and said power means;

means connected to said moveable vehicle for positionably moving said tether vertically to a particular vertical position relative to said ceiling; and

means in said aircraft for changing the flight attitude of said aircraft relative to said tethering means.

4,037,359

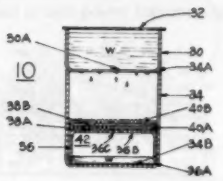
BEAN SPROUT METHOD AND APPARATUS FOR GROWING SAME

Ting-fu Peng, and Eng-Chin Peng, both of Baltimore, Md., assignors to Terrell C. Birch, Falls Church, Va.

Continuation-in-part of Ser. No. 478,578, June 12, 1974. This application Aug. 20, 1975, Ser. No. 605,997

Int. Cl.² A01C *1/00*

U.S. Cl. 47—14 **2 Claims**



1. Self watering kit means for growing edible sprouts from seeds comprising:

a growth chamber comprising a container constructed of water impervious material and open only at its top end, said container being devoid of any drain means below its top end;

an open top, inverted vessel of material porous to the passage of liquid only by capillary action mounted on the bottom of said growth chamber and having both a side wall and a bottom portion of said material, said bottom portion extending across substantially the entire transverse cross-section of said growth chamber and spaced from the bottom of the latter to thereby provide an elevated support surface;

a primary water reservoir comprising an open top container of material porous to the passage of liquid only by capillary action and acting in conjunction with the force of gravity and the head of water contained therein to supply water to said growth chamber, said primary water reservoir substantially closing and engaged with the top of said growth chamber, but permitting the flow of air therebetween into and out of said growth chamber;

a perforate lid covering the top of said primary reservoir; and

at least one absorbent membrane overlying and coextensively juxtaposed with said elevated support surface for receiving a layer of seeds for sprouting;

said growth chamber preventing any loss of water from said means for growing edible sprouts at any point except by the flow of air into and out of said growth chamber; and

said sidewall of said inverted vessel conducting water by capillary action from the bottom of said growth chamber up to the bottom portion of said inverted vessel.

4,037,360

RAFT APPARATUS FOR GROWING PLANTS BY MEANS OF WATER CULTURE

Robert S. Farnsworth, 99 Somerset Road, Piedmont, Calif. 94611

Continuation-in-part of Ser. No. 537,198, Dec. 30, 1974, Pat. No. 3,927,491. This application Dec. 19, 1975, Ser. No. 642,554

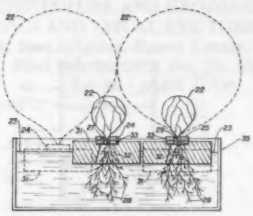
Int. Cl.² A01G *31/00*

U.S. Cl. 47—63 **7 Claims**

1. Raft means for the hydroponic growth of at least one plant thereon including a raft body formed to float on a nutrient solution in a stable position, said body being formed with a generally vertically oriented channel extending from a foliage supporting upwardly facing side of said body through said body to a nutrient solution contacting downwardly facing side of said body, said channel having a transverse dimension formed for receipt of the stem of a plant therein with the root system of said plant depending downwardly into said nutrient

solution, and said body having sufficient buoyancy to float said plant on said nutrient solution and said body extending laterally in all directions from said channel a distance sufficient to support the foliage of said plant above said nutrient solution during a substantial portion of the growth cycle of said plant, wherein the improvement in said raft means comprises:

auxiliary buoyancy means engaging said body and formed to



assist in the buoyant support of said body on said nutrient solution by providing auxiliary stability and buoyancy for said body, said auxiliary buoyancy means being formed with a generally vertically oriented auxiliary channel in substantially aligned registration with said channel in said body, and said auxiliary channel being dimensioned for downward depending of the root system of said plant therethrough.

4,037,361

PLANT WATERING STICK

William R. Murphy, and Frances H. Murphy, both of 1210 W. Boynton Road, No. 114, Boynton Beach, Fla. 33435

Filed Sept. 8, 1976, Ser. No. 721,345

Int. Cl.[2] A01G *29/00*

U.S. Cl. 47—48.5 **8 Claims**

1. A plant watering device comprising:

an elongated tubular body having a funnel-shaped end portion;

a cap pivotably connected to said funnel-shaped end portion; and

bendable hinge means on said tubular body adjacent said funnel-shaped end portion for rotating said funnel-shaped end portion from a substantially horizontal to a substantially vertical plane.

4,037,362

DEVICE FOR SOILLESS GROWTH OF PLANTS

Darrel S. Finck, 4180 E. Avenue, Hayward, Calif. 94544

Filed Aug. 27, 1976, Ser. No. 718,347

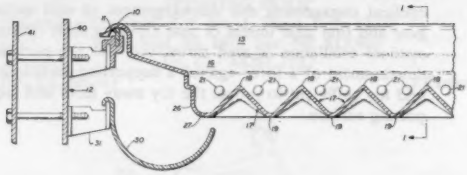
Int. Cl.[2] A01G *31/00, 25/00*

U.S. Cl. 47—59 **4 Claims**

1. A device useful in soilless growth of plant materials comprising a tray element including:

a. sidewalls wherein two opposing sidewalls have rail-engaging members, two opposing sidewalls have holding protrusions, and at least two sidewalls slope with respect to vertical to provide upwardly expanding area of said device,

b. a bottom, including plural corrugations having upper crests and lower crests, wherein the plane including the tops of all upper crests is a surface draining toward said sidewalls and wherein said plane intersects said sidewalls immediately below said holding protrusions, and the bot-



toms of all corrugations are shaped to drain into a common liquid-collecting passageway, and

c. a membrane made of water-impervious, non-porous, stiff but bendable material extending across and in contact with the tops of all of said corrugations, substantially in contact with all of said sidewalls and beneath said holding protrusions whereby said membrane forms an upper surface from which liquid will flow from the center of said surface toward the sidewalls.

4,037,363

METHOD AND APPARATUS FOR INCREASING THE AVAILABLE VOLUME FOR A NUTRITIVE SOLUTION CONTAINED IN A HYDROPONIC RECEPTACLE

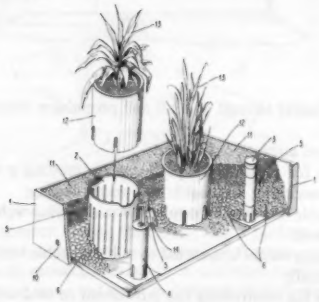
Gerhard Baumann, Bern, Switzerland, assignor to Interhydro A. G., Bern, Switzerland

Filed Mar. 26, 1975, Ser. No. 562,128

Claims priority, application Switzerland, Mar. 29, 1974, 4421/74

Int. Cl.[2] A01G *31/02*

U.S. Cl. 47—59 **6 Claims**



4. A system for increasing the available volume for a nutritive solution contained in a hydroponic receptacle into which at least one plant and a substratum have been placed, comprising a plurality of hollow shells placed on the bottom of the receptacle to a level just bove the maximum level of the nutritive solution, and a layer of material covering said hollow shells.

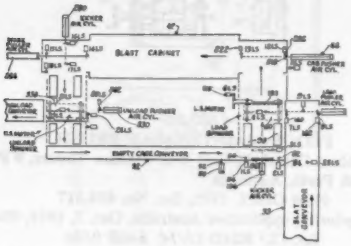
4,037,364
METHOD AND MEANS FOR CONTINUOUS SURFACE TREATMENT

Ardee H. Freeman, Granger; Harold F. Schulte, Mishawaka, and Hubert Davidson, South Bend, all of Ind., assignors to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Continuation of Ser. No. 871,145, Oct. 13, 1969, abandoned, which is a division of Ser. No. 551,395, May 19, 1966, Pat. No. 3,517,465. This application June 9, 1975, Ser. No. 584,748

Int. Cl.[2] B24C *3/14, 3/30*

U.S. Cl. 51—41. **13 Claims**



1. A continuous cleaning apparatus comprising an elongated cage, said cage having an open feed end and an open discharge end to permit the axial movement of a part therethrough, feed means for delivering a part to said feed end one at a time, discharge means for receiving a part from said discharge end, cleaning means positioned along said cage and external thereto for cleaning a part carried therein, said cage being of skeletal form with open portions in its periphery to permit cleaning media from said cleaning means to enter and pass through said cage, means for advancing a part past said cleaning means, rotation means connected to continuosly rotate said cage to cause a part therein to continuously rotate as it is cleaned and advanced past said cleaning means, and means at said feed end for removing a part from said feed means and disposing it in said cage.

5. In a machine for the surface treatment of articles of large dimension comprising a plurality of open cages having longitudinally spaced apart supporting ring members interconnected by longitudinal members arranged to define an open space in between for receiving the articles, means for loading the cages by displacement of the articles endwise into the cages, means for unloading the cages by displacement of the articles out of the cages, comprising a pair of spaced rollers mounted for rotational movement in one direction, means for displacement of a cage onto the rollers with the ring members riding on the rollers for rotational movement of the supported cage, an abutment means for stopping rotational movement of the cage when the latter becomes properly oriented for insertion of an article into or out of the cage, means for alignment of an article endwise of the cage at the loading station, ram means located adjacent one end of the article and power operated means for actuation of the ram in an endwise stroke between extended and retracted positions of adjustment to engage the article for displacement endwise into the aligned cage at the loading station and from the cage at the unloading station during the stroke of the ram.

4,037,365
APPARATUS FOR CUTTING ARCUATELY-SHAPED WORMS

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 25, 1976, Ser. No. 699,760

Int. Cl.[2] B24B *5/26*

U.S. Cl. 51—97 R **1 Claim**

1. An apparatus for cutting a worm blank to generate an arcuate worm, said apparatus comprising in combination:

a frame pivotally mounted for swinging movement about a fixed axis;

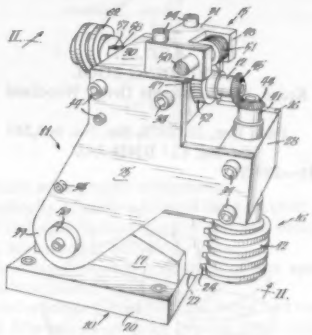
a support shaft journalled in said frame for axial rotation about an axis which is in a plane generally perpendicular to said fixed axis, said support being adapted to carry a worm blank with the worm axis on the support shaft axis;

a fixed gear segment the radius of curvature of which is centered on said fixed axis;

power means for rotating said support shaft including

a power transmission shaft journalled in said frame and adapted to be connected to a source of power to receive rotational torque therefrom,

an input worm fixed to said power transmission shaft, and



a spur gear fixed to the support shaft and meshing with said input worm, whereby rotation of the power transmission shaft rotates the support shaft;

cutting means disposed adjacent to a worm blank on the support shaft for cutting a groove in the surface of said worm blank;

a gear journalled in the frame and engaged with said fixed gear segment; and

means for driving said gear in timed relationship with said shaft so that it traverses said fixed gear segment to swing the frame about said fixed axis whereby said worm blank is arcuately translated relative to said cutting means as said worm blank is rotated on the worm axis so that an arcuate worm is generated from said worm blank.

4,037,366
PROFILE SANDER

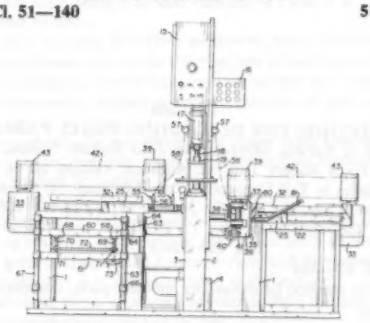
Earlyn Elridge Shuffler, Cowansville, Canada, assignor to Vilas Industries Limited, Cowansville, Canada

Filed Jan. 12, 1976, Ser. No. 648,107

Claims priority, application Canada, July 22, 1975, 232005

Int. Cl.[2] B24B *21/02, 21/14*

U.S. Cl. 51—140 **5 Claims**



1. A profile sanding machine including a turntable on which a wooden work-piece is mounted; pneumatically operated

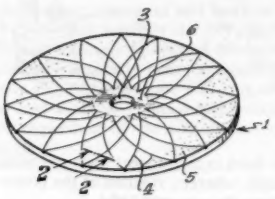
means for clamping said work-piece to said turntable; a pair of sanding units, at least one of which is adjustable in relation to said work-piece at least in a vertical plane; each of said sanding units including a roller at one end thereof, an inflatable air bag at the other, and a sanding belt disposed around said roller and bag, the vertical axis of each said air bag capable of movement toward and away from the vertical axis of said roller, and means for moving each said unit into and out of sanding contact with the profile of said work-piece and for maintaining said contact under constant pressure during a predetermined number of rotations of said turntable.

4,037,367

GRINDING TOOL

James A. Kruse, 22937 Ostronic Drive, Woodland Hills, Calif. 91364

Filed Dec. 22, 1975, Ser. No. 643,347
Int. Cl.[2] B24D *7/02*
U.S. Cl. 51—209 S **15 Claims**



1. A rotary grinding disk adapted for grinding under a flowing liquid film having a flat top supporting surface to which particles of abrasive are rigidly bonded and a network of grooves of constant depth and width traversing said supporting surface to provide a continuum of centrifugal drainage channels in the radial direction and subdividing said supporting surface into working elements of quadrilateral shape at least 0.25 inch in length on each side, said sides being inclined to the radius at an acute angle of 0° to 75° measured in either sense, wherein a family of concentric circles each trace circular arcs partly across said working elements of arc length L_E, and partly across said grooves of arc length L_G and wherein the ratio of arc length L_E/L_G is at least 1.5, said grooves being substantially rectangular in cross-section, having a depth of 0.00004 inch (1 micron) to 0.1 inch (2540 microns), and a width of 0.0002 inch (5 microns) to 0.15 inch (3810 microns).

4,037,368

METHOD FOR DEFLASHING SMALL PARTS

William S. Kerwin, Minneapolis; John Rodney Nelson, Edina, and Hans Robert Toll, St. Anthony Village, all of Minn., assignors to Toll Cryogenics, Inc., Minneapolis, Minn.

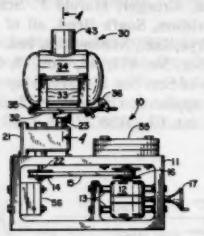
Division of Ser. No. 367,863, June 7, 1973, Pat. No. 3,909,988.
This application Apr. 11, 1975, Ser. No. 567,185
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—314 **3 Claims**

1. The method of deflashing molded parts, comprising the steps of:

a. placing a plurality of the parts to be deflashed in a generally elongated container having generally rounded ends;

b. supporting the container with its longitudinal axis generally in a horizontal plane; and

c. rotationally oscillating the container about a generally vertical axis.

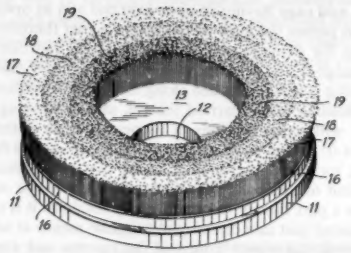


4,037,369

FLOOR MAINTENANCE BRUSH

Murray Robert Campbell, Unit W1, Windsor Towers, 9 Parker St., South Perth, Australia

Filed Oct. 1, 1975, Ser. No. 618,617
Claims priority, application Australia, Oct. 3, 1974, 9145/74
Int. Cl.[2] B24D *13/14*; A46B *9/06*
U.S. Cl. 51—400 **10 Claims**



9. A brush or pad comprising a substantially circular backing plate and fibres of varying diameter and abrasive characteristics secured to and projecting from one face of said plate, the larger diameter fibres being more abrasive and impregnated with abrasive particles, the larger diameter fibres being positioned in the central region of the brush, said fibres decreasing in diameter and abrasive characteristics radially outwardly on said plate, the least abrasive fibres being unimpregnated and disposed in the outer peripheral area of the brush.

4,037,370

CARTON CLOSING AND SEALING APPARATUS

E. Alan Williams, Saratoga, Calif., assignor to Nolex Corporation, Los Angeles, Calif.

Filed Nov. 3, 1975, Ser. No. 628,443
Int. Cl.[2] B65B *7/16*
U.S. Cl. 53—375 **37 Claims**

1. Apparatus for effecting liquidtight closure of an open end of a liquid-filled carton having at said open end a single closure panel integral with the body of the carton and adapted to be brought into a closure position relative to the body of the carton and also having at said open end a plurality of narrow sealing tabs integral with the body of the carton and directed inwardly thereof for surface contact with the inside surface of said closure panel, said apparatus comprising:

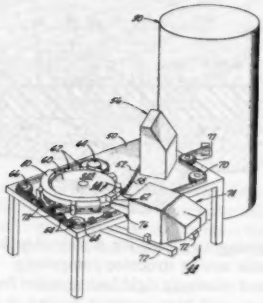
platform means for supporting said carton in an upright position;

means for preparatorily conditioning the inner surface of the closure panel and the outer surfaces of the sealing tabs for adhesive interengagement;

means engageable with the outer surface of the single carton

closure panel for closing it into pressure contact with the narrow sealing tabs to effect liquidtight surface interengagement between the carton closure panel and the narrow sealing tabs; and

means having smooth flat carton-wall matching surfaces for completely engaging the carton walls and non-deformably



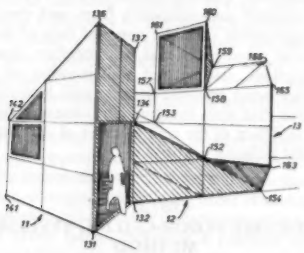
clasping the carton in substantially complete contacting and gripping encompassment immediately below the top of the carton to reinforce and impart rigidity to the walls of the liquid-filled carton during the application of said pressure contact by the closure panel closing means and preclude crushing of the carton walls.

4,037,371

CONSTRUCTION OF BUILDINGS BY ASSEMBLING PREFABRICATED ELEMENTS

Yves Jean Olivier de la Lande de Calan, 25 Rue du Faubourg St.-Honore, Paris 8e, France

Filed Aug. 8, 1975, Ser. No. 603,091
Claims priority, application France, Aug. 12, 1974, 74.27862
Int. Cl.[2] E04H *1/02*
U.S. Cl. 52—79.7 **6 Claims**



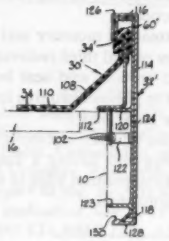
1. A system of building construction with prefabricated elements, comprising a plurality of juxtaposed elemental volumetric units joined to define a hollow functional building of non-rectangular configuration, said units including at least one irregular tetrahedron and at least one irregular pyramid with a rectangular base, said tetrahedron and said pyramid being mutually determined by a plane passing through one side of an equilateral triangular base of a right prism and the apex of the other base opposite said one side, the height of the right prism being U and the length of the sides of the equilateral triangular bases of the right prism being 2U.

4,037,372

ROOF FACIA ARRANGEMENT

Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

Filed June 9, 1975, Ser. No. 584,809
Int. Cl.[2] E04D *13/14, 5/14, 3/36*
U.S. Cl. 52—96 **16 Claims**



1. A roof facia arrangement comprising:

a. a longitudinally extending integral facia receiver adapted to fixely rest against adjoining top and side surfaces of a building, said receiver including

i. a vertical receiver section adapted to rest against the side surface of said building,

ii. a second receiver section located above and transverse to said first section extening beyond both sides of said first section, a portion of said second section being adapted to rest against the top surface of said building, and

iii. a vertical third section having an uppermost edge and located above said fist and second sections, said third section being connected with said second section and spaced forwardly of said first section;

b. a longitudinally extending intermediate member substantially shorter longitudinally than said receiver and including

i. a vertical main section substantially longer vertically than said receiver,

ii. an inverted U-shaped section located above and extending rearwardly of said main section,

iii. first interlocking means located below and extending rearwardly of said main section, and

iv. second interlocking means connected with and extending rearwardly from said main section above said interlocking means and below said inverted U-shaped section;

c. said receiver and intermediate member being connected together such that

i. said main section of said member is located in front of said receiver,

ii. said inverted U-shaped section is positioned over the uppermost edge of the third section of said receiver, and

iii. said section interlocking means engages in force-fitting relationship against a second portion of said second receiver section;

d. a longitudinally extending facia cover plate substantially longer longitudinally than said intermediate member, said cover plate including

i. a vertical main section,

ii. an inverted U-shaped section located above and extending rearwardly of said last-mentioned main section, and

iii. interlocking means located below and extending rearwardly of said last-mentioned main section;

e. said cover plate, receiver and intermediate member being connected to together such that

i. said main section of said cover plate is located in front of said receiver and intermediate member,

ii. said inverted U-shaped section of said cover plate is positioned over said inverted U-shaped section of said

member and over said uppermost edge of said third receiver section, and

iii. said interlocking means of said cover plate is interlocked with said first interlocking means of said intermediate member, and

iv. said cover plate is free to move longitudinally relative to said receiver and intermediate member but held substantially fixed relative to said receiver and member in all other directions;

f. a longitudinally extending moisture seal located between the uppermost edge of said third receiver section and said inverted U-shaped section, said seal being of sufficient resiliency so as not to prevent said free longitudinal movement of said cover plate; and

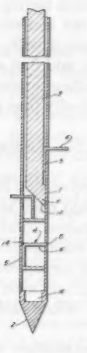
g. a flashing membrane adapted to extend over the top surface of said building and having a longitudinal portion located between the uppermost edge of said third receiver section and said moisture seal.

4,037,373

EARTH ANCHOR

Sigmund Echtler, Sickinger Strasse 1, 8000 Munich 50, Germany

Filed Aug. 2, 1976, Ser. No. 711,077
Claims priority, application Germany, Aug. 6, 1975, 2535162
Int. Cl.[2] E02D *5/80*
U.S. Cl. 52—127 **10 Claims**



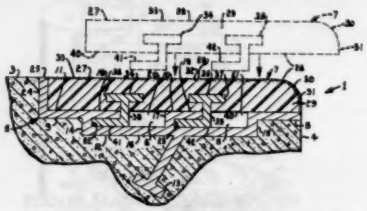
1. An earth anchor comprising an elongated tube of polygonal section having a plurality of elongated longitudinally extending flat sides at least some of which are each formed with a throughgoing slot spaced longitudinally from the other slots and extending substantially perpendicular to the respective side, said tube having a pointed end and an open end; and a plurality of L-shaped anchor elements each having a flat anchor leg slidable substantially perpendicular to said tube in a respective slot and extending substantially perpendicularly to said tube and a flat guide leg extending substantially parallel to said tube substantially perpendicularly from the respective anchor leg toward said pointed end and slidable substantially perpendicularly in said tube on the anchor leg of the adjacent anchor element, each element being slidable in a direction substantially perpendicular to said tube between an inner position with its anchor leg substantially received within said tube and an outer position with its anchor leg projecting substantially perpendicularly from said tube through the respective slot and with its guide leg lying flatly against the inner surface of the respective side below the respective slot.

4,037,374

STAIR NOSING STRUCTURE

Claude P. Balzer; Almer A. Reiff, and Edward M. Corman, all of Wichita, Kans., assignors to Balco Inc., Wichita, Kans.

Filed May 17, 1976, Ser. No. 686,741
Int. Cl.[2] E04F *11/16;* **E04C** *5/03*
U.S. Cl. 52—179 **5 Claims**



1. A stair nosing structure for a stair step having a tread surface, said stair nosing structure comprising:

a. an elongated relatively rigid base member for mounting on a stair step, said base member having a forward edge portion and a rear edge portion and upwardly facing portions, said base member having an anchor portion for securing said base member to the stair step, said base member having portions defining a channel extending along the length thereof and presenting opposite substantially parallel faces, said base member channel defining portions including wall members extending from said base member adjacent the rear edge portion thereof;

b. an elongated tread member having a forward edge portion and a rear edge portion and overlying said base member, said tread member having portions engaging said upwardly facing portions of said base member;

c. elongated means extending from said tread member and engaging said base member with an interference engagement with spaced portions of said base member including at least one of said opposed faces of said channel defining portions of said base member to secure said tread member to said base member, said elongated means extending from said tread member including:

1. a first wall member at a rear edge portion of said tread member and having a face engageable with a face of one wall member of said base member channel defining portions; and

2. a second wall member spaced forwardly from said first wall member and extending from said tread member and engageable with the opposed face of the other of said wall members of said base member channel defining portions, said second wall member of said tread member being resilient to urge said face of the tread member first wall member into clamping engagement with said face of the wall member of said base member channel defining portions.

4,037,375

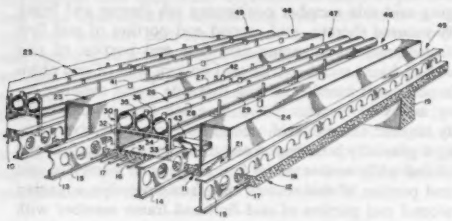
MULTI-STORY FLOOR-CEILING SYSTEM AND METHOD

Theodore Maggos, 509 E. 72nd St., New York, N.Y. 10021; David H. Geiger, Kirby Lane, Rye, N.Y. 10580; Sheldon M. Steiner, 184-61 Tudor Road, Jamaica, N.Y. 11432, and Henry D. Gregorio, 12 Deepdale Court, Glencove, N.Y. 11542

Filed Aug. 18, 1975, Ser. No. 605,666
Int. Cl.[2] E04B *5/48, 5/36, 1/16*
U.S. Cl. 52—220 **16 Claims**

1. A floor-ceiling construction for multi-story buildings, comprising: a bottom membrane having significant tensile strength, said membrane including laterally spaced strip elements, void-producing ductwork supported on said membrane and regularly arranged creating with said membrane a form, said ductwork including ducts open at the bottom ridging the

lateral space between said strip elements, a poured-in-place plastic material encasing said form, said poured-in-place plastic material including a regular arrangement of structural elements alternating with said ductwork, and said bottom membrane



including upwardly projecting elongated keying elements between said ductwork adapted to integrate said membrane with said poured-in-place material and increase the strength of said structural elements when said poured-in-place material cures.

4,037,376

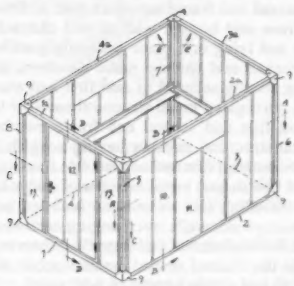
BUILDING STRUCTURE

Baruch Baal-Taxa, 3 Mivzah Kadesh St., Tel Baruch, Israel

Filed June 23, 1975, Ser. No. 589,534

Int. Cl.[2] E04H 7/00; E04C 2/38

U.S. Cl. 52—280 **14 Claims**



1. A structural assembly including at least one structural unit, comprising a plurality of panels each having edge portions; means forming a base frame for said unit, including a plurality of lower elements each having channels for receiving lower edge portions of a respective panel; means forming a top frame for said unit, including a plurality of upper elements each having channels for receiving upper edge portions of a respective panel, each channel of an upper element having a closed side, an open side opposite said closed side, and a pair of side walls extending intermediate said closed and open sides, one of said side walls converging towards the other of said side walls in direction towards said open side; means connecting said base frame to said lower frame, including a plurality of upright elements intermediate said lower and upper elements, each upright element having a channel receiving side edge portions of a respective panel; and wedging means securing a respective panel in said channels, including wedging members each having a movable portion in a respective channel of an upper element, each movable portion having a first part in sliding engagement with extending generally parallel to an inner surface of said one side wall, and a second part overlying an inner surface of said other side wall, each wedging member also having a handle portion located exteriorly of said respective channel and operative for moving an movable portion so that said first part slides along said one side wall between an inoperative retracted position and an operative panel-wedging position in which said second part frictionally engages a region of said other side wall and in which said first part frictionally engages said upper edge portions of said respective panel so as to wedge the latter against another region of said other side wall.

4,037,377

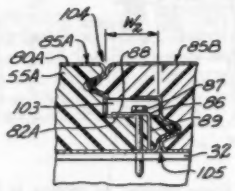
FOAMED-IN-PLACE DOUBLE-SKIN BUILDING PANEL

Norbert C. Howell, Connersville; Walter Tischuk, Richmond, and Thomas M. Welsh, Connersville, all of Ind., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 732,689, May 28, 1968, abandoned. This application Nov. 3, 1970, Ser. No. 86,425

Int. Cl.[2] E04C 1/10, 2/20

U.S. Cl. 52—309.9 **33 Claims**



1. A building construction panel comprising an outer facing sheet, an inner facing sheet and a foamed-in-place core disposed between the said outer facing sheet and the said inner facing sheet;

each of said facing sheet having a central web and a first side edge and a second side edge,

a first side wall extending along the said first side edge,

a second side wall extending along the said second side edge,

a first flange re-entrant from the said first side wall generally parallel to the said central web, and

a second flange extending outwardly from the said second side wall generally parallel to the said central web;

said outer facing sheet and said inner facing sheet being arranged with said second flange of each facing sheet confronting the opposing central web of the other facing sheet, and with the second flange of each facing sheet laterally sapced-apart from the said first flange of the other facing sheet whereby the said outer facing sheet is entirely spaced-apart from the said inner facing sheet; and

complementary mating elements formed in said outer facing sheet, one disposed lengthwise of one said side wall and one disposed lengthwise of the other said side wall, said complementary mating elements being distinct and spaced from said first flange and said second flange of said outer facing sheet;

the said outer facing sheet including:

a channel-like configuration defined by the said first flange, the first side wall and an adjoining portion of the said central web;

said foamed-in-place core filling the channel-like configuration whereby a positive mechanical connection is provided between the said outer facing sheet and the said foamed-in-place core;

said panel adapted to be engaged side-by-side with others of said panel, with one of said mating elements of each panel engaged with the complementary mating element of an abutting panel whereby the outer facing sheets are mechanically engaged with one another.

4,037,378

WINDOW FRAME

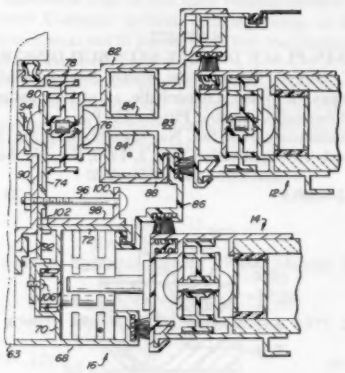
David R. Collins, Washington Crossing, Pa., and Sheldon N. Katz, Cherry Hill, N.J., assignors to Replacement Products Industries Corporation, Cornwells Heights, Pa.

Filed Feb. 24, 1976, Ser. No. 660,760

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] E04B *1/62;* E06B *3/54;* E05C *3/02*

U.S. Cl. 52—397 8 Claims



1. A window frame adapted to receive at least one sash comprising a rectangular frame having an outdoor face and an indoor face, said frame having side members connected to a top member and a sill member, four corner members of non-metallic material whose width corresponds to the general width of said faces on said frame, each frame member being connected to an adjacent frame member by one of said corner members, each frame member having a metal component on the outdoor face thermally insulated from a metal component on the indoor face by a non-metallic thermal barrier strip, each barrier strip having spaced parallel zones of contact with juxtaposed walls of said metal components associated therewith, and non-metallic fasteners structurally connecting said juxtaposed walls and the thermal barrier strip associated therewith.

4,037,379

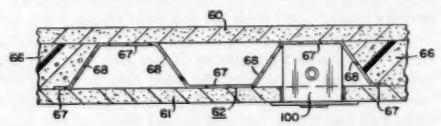
WALL PANEL

Leroy Ozanne, 15800 S. Woodland, Shaker Hts., Ohio 44120

Filed July 8, 1976, Ser. No. 703,640

Int. Cl.[2] E04B *1/74;* E04C *1/16, 1/10*

U.S. Cl. 52—404 15 Claims



1. A generally rectangularly shaped building wall panel including in combination: first and second spaced and parallel side frame members each having first and second end portions, first and second spaced and parallel end frame members each having first and second end portions, said end frame members being identical in construction, each said end frame member comprising a channel shaped metal member having a bottom wall and first and second sidewalls, a generally rectangularly shaped side member positioning tab formed from said bottom wall of said channel shaped metal member at each of said first and second end portions of each of said end frame members, said side member positioning tabs extending normal to said bottom wall and normal to the longitudinal extent of said channel shaped metal member, said first side frame member comprising a channel shaped metal member having a bottom wall and first and second sidewalls, said first end portion of said first side frame member engaging said first end portion of said first end frame member with said bottom wall of said channel shaped metal member of said first side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, said second end portion of said first side frame member engaging said first end portion of said second end frame member with said bottom wall of said channel shaped metal member of said first side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, said second side frame member comprising a generally box shaped metal member having first and second end walls connected by first and second sidewalls, said first end portion of said second side frame member engaging said second end portion of said first end frame member with said first end wall of said box shaped metal member of said second side from member engaging said side member positioning tab thereat and being fixedly secured thereto, said second end portion of said second side frame member engaging said second end portion of said second end frame member with said first end wall of said box shaped metal member of said second side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, a corrugated metal structural member having first and second end portions, said first end portion of said corrugated structural member engaging said first end frame member intermediate said first and second end portions thereof, said second end portion of said corrugated structural member engaging said second end frame member intermediate said first and second end portions thereof, additional tabs located at said intermediate portions of said first and second end frame members, said additional tabs being formed from said bottom wall of said channel shaped metal members and lying in a plane generally parallel to the longitudinal extent of said channel metal members, said additional tabs being fixedly secured to said first and second end portions of said corrugated metal structural member to secure the same to said first and second end frame members, said corrugated metal structural member having a width less than the distance between said first and second side frame members, a portion of said box shaped metal member of said second side frame member including said second end wall and portion of said first and second sidewalls overhanging said second end portions of said first and second end frame members in position to be received in the channel shaped metal member of the first side frame member of another building wall panel.

4,037,380

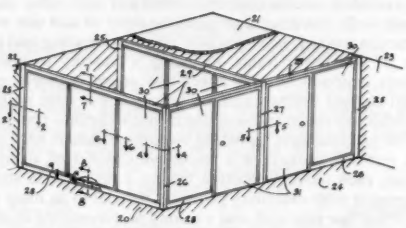
INTERIOR PARTITION STRUCTURE WITH RESILIENTLY-BIASED PANELS

Gordon J. Pollock, 2039 Wooster Rd. No. 45, Rocky River, Ohio 44116

Filed Jan. 29, 1976, Ser. No. 653,550

Int. Cl.[2] E04B *2/82, 2/76*

U.S. Cl. 52—483 15 Claims



1. In a multi-panel partition structure for creating an enclosure in an interior chamber of a building, the combination of a plurality of vertical support posts extending upwardly from the floor of the chamber in predetermined horizontally spaced

relationship to define the peripheral outline of the partition structure, a panel-support base extending between each adjacent pair of said support posts and engaging the floor of the chamber, a plurality of vertically extending partition panels resting on said base in yieldably compressed co-planar abuting relationship with each other between said support posts, but free from securement or attachment with each other or with said posts whereby each of said panels is movable into or out of said partition structure independently of any other panel and without dissassembly of any other element of said partition structure, said panels having parallel top and bottom edges, a head-piece extending horizontally between said support posts and secured relatively thereto at a predetermined height, and spring means carried by said head-piece and operatively engaging the top edges of said partition panels to bias said panels into yieldable compression abutment with said base.

4,037,381

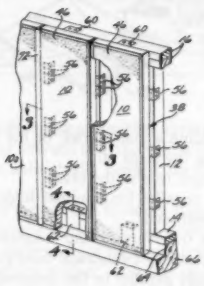
BUILDING PANEL

Fred J. Charles, 9112 Lubec St., Downey, Calif. 90240

Filed Mar. 17, 1976, Ser. No. 667,652

Int. Cl.² E04C *2/28, 2/46*

U.S. Cl. 52—627 **4 Claims**



1. A building panel comprising:

a rectangular metal frame adapted to span adjacent studs of a building wall and including a pair of side members each adapted to overlie a portion of the width of one of the adjacent studs;

building material filling said frame and defining exterior and interior faces; and

a plurality of metal tabs spaced along and fastened to said side members and each including an attachment leg bent inwardly of and at a right angle relative to said interior face, said legs each having an upper edge and a lower edge, the upper edges of said legs on one of said side members being transversely aligned with the lower edges of said legs, respectively, on the other of said side members whereby said building panel is properly aligned with an adjacent, like building panel upon engagement between said upper edges of said building panel and said lower edges of the adjacent building panel, each of said legs being offset laterally, to one side of the associated one of said side members whereby each of said legs is adapted for orientation upon and securement to the side of a building stud.

4,037,382

SCAFFOLDING

Daniel Jacobs, Johannesburg, South Africa, assignor to Form-Scaff (Proprietary) Limited, Johannesburg, South Africa

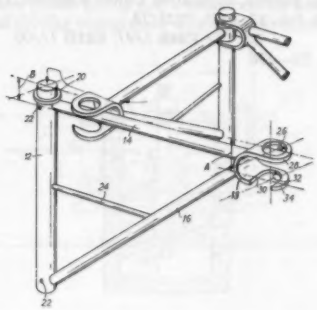
Filed Apr. 22, 1976, Ser. No. 679,248

Claims priority, application South Africa, Apr. 24, 1975, 75/2650

Int. Cl.² E04H *12/10;* **E04G** *1/06*

U.S. Cl. 52—638 **9 Claims**

1. In a scaffolding element of the kind comprising a right angled triangular frame consisting of a vertical member, a horizontal member extending from near the upper end of the vertical member, an inclined member extending upwardly from near the lower end of the vertical member, an end element at the ends of horizontal and inclined members the improvement that the end element comprises a locating and locking yoke having an upper part and a lower part both fixed as to vertical movement relative to the horizontal member the



upper part having an aperture of a diameter slightly greater than the diameter of the vertical member and the space between the upper and lower parts slightly greater than the distance between the end of the vertical member and the underside of the horizontal.

4,037,383

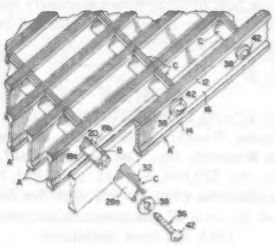
METAL GRATING

William H. Diebold, Hudson, and Adolph D. Russo, Beechwood, both of Ohio, assignors to Russo Architectural Metals, Inc., Twinsburg, Ohio

Filed Sept. 16, 1976, Ser. No. 723,731

Int. Cl.² E04C *2/42*

U.S. Cl. 52—664 **11 Claims**



1. A metal grating comprising:

a plurality of spaced parallel extending bearing bars including a pair of outer bearing bars and a plurality of intermediate bearing bars therebetween, said bearing bars having a plurality of spaced transverse openings along their length with the openings of each bearing bar being aligned with openings of an adjacent bearing bar;

a plurality of transverse cross bars each passing through respective aligned openings in said bearing bars;

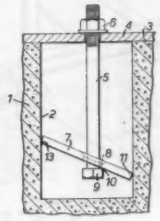
a plurality of spacer members each mounted on a cross bar in the space between adjacent pairs of said bearing bars, means holding said spacer members in position on said cross bars, and

fastening means acting in conjunction with said outer bearing bars and the ends of said cross bars placing said cross bars in tension and said bearing bars and said spacer members in compression.

4,037,384
ANCHORAGE ASSEMBLIES

Godfrey Matthew Owen Molyneux, Burway, Rudford, Gloucestershire, England

Continuation of Ser. No. 441,321, Feb. 11, 1974, abandoned.
This application Aug. 21, 1975, Ser. No. 606,457
Claims priority, application United Kingdom, Feb. 10, 1973, 6658/73; Feb. 17, 1973, 7925/73
Int. Cl.[2] E04B *1/41*; E01D *11/00*
U.S. Cl. 52—698 11 Claims

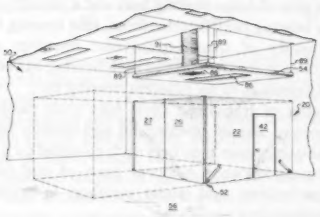


1. An assembly comprising a base having a blind hole therein, a structural member having an aperture registering with said hole, a bolt having enlargements adjacent opposite ends thereof, one of said enlargements being a nut screw-threadedly received on the bolt, the bolt extending through said aperture, one of said enlargements being in said blind hole and the other of said enlargements being on the side of said structural member opposite said hole, and a single washer element on the bolt within the hole and jammed without significant penetrations against the sides of the hole when the bolt and the nut are mutually tightened, said washer element having at least two peripheral points with an undistorted span greater than at least one transverse dimension of the hole, the bolt being held captive to the washer solely by said enlargement within the hole, and the washer providing an aperture enabling the bolt to tilt but not to move substantially laterally relative to the washer, thereby ensuring that said enlargement within the hole exerts a force eccentric with respect to said two points and enabling the bolt to be adjusted angularly within the hole to emerge from the hole at a selected position before the nut and bolt are mutually tightened.

4,037,385
PORTABLE ROOM CONSTRUCTION AND METHOD

Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Los Angeles, Calif.

Division of Ser. No. 522,664, Nov. 11, 1974, Pat. No. 3,984,949.
This application Mar. 3, 1976, Ser. No. 663,315
The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.
Int. Cl.[2] E04B *1/343*
U.S. Cl. 52—745 6 Claims



1. A method of assemblying an interior room within a space, the steps of:

providing an assembly of initially folded wall panels in a generally vertical orientation, the assembly together forming four walls of a room;

relocating the assembly by moving the entire assembly to a predetermined location within the space;

unfolding the wall panel assembly to form an enclosure;

lowering a ceiling unit until at least a portion of the weight of the ceiling unit rests upon the unfolded wall panel assembly; and

downwardly displacing the wall panel assembly under the weight of the ceiling unit until a seal is formed simultaneously at the top and bottom of the wall panel assembly.

4,037,386
METHOD OF FOLDING AND ROLLING BRIEFS

Carl F. Sjoman, Los Angeles, Calif., assignor to Team Industries, Los Angeles, Calif.

Division of Ser. No. 501,693, Aug. 29, 1974, Pat. No. 3,965,647.
This application Mar. 15, 1976, Ser. No. 666,866
Int. Cl.[2] B65B *63/04*
U.S. Cl. 53—21 FW 2 Claims

1. A method of folding a man's brief, or the like, having a waistband, comprising the steps of:

a. making a transverse fold in the brief;

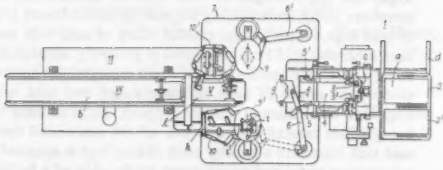
b. making spaced, parallel longitudinal folds in the transversely folded brief; and

c. then rolling the transversely and longitudinally folded brief into a substantially cylindrical configuration having an axis substantially parallel to the longitudinal folds and with the waistband at one end.

4,037,387
METHOD OF FILLING AND SEALING BAGS

Yoshizumi Orikawa, Hiroshima, Japan, assignor to Showa Seitai Co. Ltd., Japan

Filed Aug. 13, 1975, Ser. No. 604,285
Claims priority, application Japan, Aug. 13, 1974, 49-92928
Int. Cl.[2] B65B *43/30*
U.S. Cl. 53—29 3 Claims



1. In a method of filling and sealing bags, in combination the steps of:

i. providing a supply of unsealed empty bags

ii. sequentially removing the individual bags from said supply and moving them to a bag-positioning station

iii. in alternated transfer steps transferring each bag by respective transfer means from the bag-positioning station to a respective one of two filling stations

iv. in alternated filling steps filling each bag in its respective filling station

v. in alternated steps inserting in each bag at its respective filling station a weighed quantity of material

vi. in alternated steps moving each filled bag by respective conveyance means to a bag-forwarding station

vii. in alternated steps forwarding each filled bag from the bag-forwarding station to a bag-sealing station

viii. in alternated steps sealing each bag in the bag-sealing station.

4,037,388

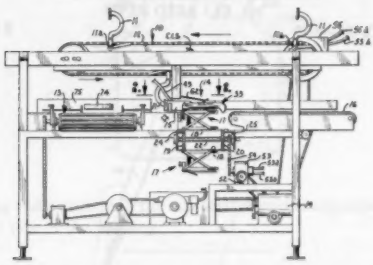
BAG SUPPLY SYSTEM FOR BAGGING MACHINE

Frank J. Bastasch, Palos Verdes Estates, Calif., assignor to United Bakery Equipment Company, Inc., Kansas City, Kans.

Filed June 1, 1976, Ser. No. 691,234

Int. Cl.[2] B65B *57/04, 43/32*

U.S. Cl. 53—64 **4 Claims**



1. In an article bagging machine having a pusher for moving articles linearly toward and through a bagging station where the articles are individually bagged, the combination therewith of

a bag supply conveyor extending transversely with respect to the bagging station and supporting a plurality of bag tables for movement of the tables transversely into and out of the bagging station, each bag table adapted to carry a stack of bags,

power means operable to drive said conveyor at intermittent intervals thus to move the bag tables successively into and out of the bagging station, and

control means operable to cause engagement of said power means when the last bag has been removed from the table in said bagging station and to disengage said power means when the next bag table has arrived at the bagging station,

said bag tables having top bag support surfaces which are movable vertically relative to the conveyor and are resiliently biased toward an upwardly extended position,

means for depressing said surfaces during movement of said tables from the position next to the bagging station into the bagging station and releasing same at the station so that the table surfaces with the bags thereon may rise, and

stop means engaging the topmost bag to limit the vertical movement to less than the extended position for said surfaces so that said surfaces continue to rise as bags are progressively removed from the stack.

4,037,389

BRAKE SAFETY SYSTEM FOR A POWER DRIVEN ROTARY MOWER

Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of Ser. No. 485,946, July 5, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,696

Int. Cl.[2] A01D *69/10*

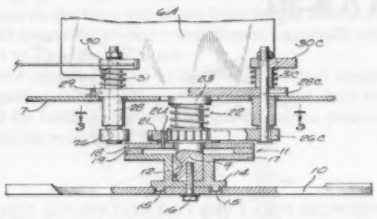
U.S. Cl. 56—11.3 **15 Claims**

5. In combination with a rotary mower having a wheel supported deck, an engine mounted on the deck with its drive shaft projecting through the deck into the space therebeneath, a cutting blade carried by the drive shaft, and means securing the cutting blade against rotation relative to the drive shaft, a selectively engageable brake mechanism operative to stop rotation of said engine drive shaft and the cutting blade and comprising:

A. a first member encircling and fixed to said shaft to rotate therewith;

B. a second member freely rotatably encircling said shaft and adjacent to said first member;

C. expansible means urging said second member axially into frictional driving engagement with said first member; and



D. manually movable stop means engageable with said second member to abruptly and positively stop rotation thereof and thus effect frictional stopping of said drive shaft and cutting blade.

4,037,390

DEVICE FOR SIDE DELIVERY OF CROP, GRASS OR GRAIN

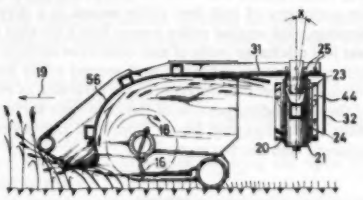
Alexander Jan Vogelenzang, Wageningsestraat 28, Andelst, Netherlands

Filed Mar. 10, 1976, Ser. No. 665,615

Claims priority, application Netherlands, Mar. 19, 1975, 7503295

Int. Cl.[2] A01D *57/20*

U.S. Cl. 56—14.5 **15 Claims**



1. A device for cutting and effecting side delivery of a crop, such as grass or grain, comprising:

a frame;

a cutting means on said frame for cutting said crop and for tossing the cut crop rearwardly of said means with a sufficient throw component whereby said cut crop moves in a path through the air for a predetermined distance;

a pair of end pulleys supported on said frame behind said implement and spaced apart a distance at least as great as the full width of said path;

at least one movable conveyor belt supported on said pulleys, said conveyor belt having a portion for receiving and effecting side delivery of said cut crop, said portion spaced rearwardly of said implement by at least said predetermined distance for directly receiving said cut crop and disposed transversely of and being within said path, said portion being disposed in a generally vertical plane;

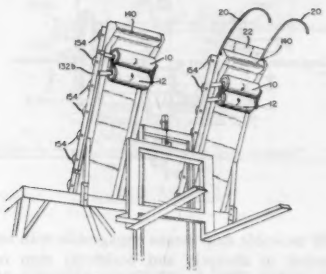
and drive means on said frame and connected to at least one of said pulleys for driving said conveyor belt in at least one direction and at a speed sufficient to cause said cut crop tossed against said portion to be retained thereagainst until said cut crop is moved to an end of said conveyor belt and to cause said cut crop to be propelled through the air from said end of said conveyor belt.

4,037,391

LEAF GUIDE MEANS FOR TOBACCO HARVESTER

John D. Mitchell, and Bertram L. Jordan, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed Sept. 20, 1974, Ser. No. 507,901
Int. Cl.² A01D *45/16*
U.S. Cl. 56—27.5 **1 Claim**



1. An improved tobacco leaf conveyor arrangement for a mobile tobacco harvester which comprises in combination:

a. an endless conveyor surface that is disposed on a tobacco harvester, the ascending portion of said endless conveyor extending rearwardly and upwardly to a leaf discharge point, the descending portion of the endless conveyor extending from said discharge point downwardly and forwardly to a point where it can receive leaves for lifting;

b. a first roller means mounted so that its periphery will press against the descending portion of the conveyor at a point near the leaf discharge point of the conveyor,

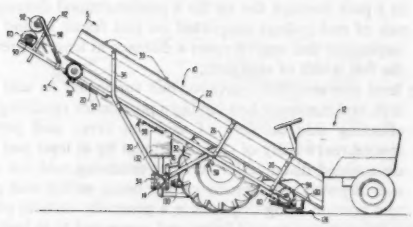
c. a second roller means mounted adjacent to and above said first roller means and with its periphery pressed against the periphery of said first roller means in a driving relationship, said second roller means being located closer to said leaf discharge point of said conveyor surface than said first roller means, whereby said second roller means will rotate in a direction opposite to the direction of movement of the descending portion of the conveyor surface to thus assist in disengaging leaves from said conveyor surface adjacent said discharge point.

4,037,392

TOBACCO HARVESTER

Miller Taylor; Jimmy N. Taylor; Oren M. Taylor, and George R. Taylor, all of Highway 701 South, Elizabethtown, N.C. 28337

Filed Jan. 27, 1976, Ser. No. 652,676
Int. Cl.² A01D *45/16*
U.S. Cl. 56—27.5 **7 Claims**



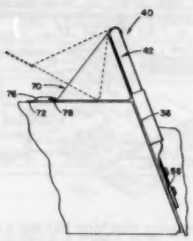
1. A tobacco harvester adapted to be mounted on a tractor comprising a frame means, inclined chute means mounted on said frame means with the lower end of said chute means disposed close to the ground, cutting means mounted on said frame means adjacent the lower end of said chute means for serving the stalk of a tobacco plant, conveyor means on said frame means for moving the cut plant up said chute means, stripping means mounted on said frame adjacent the upper end of said chute means for removing the tobacco leaves from the stalk of the cut plant and feed means mounted on said frame for pulling the stalk through said stripping means.

4,037,393

HARVESTER ATTACHMENT

Sidney Elmer Anderson, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 5, 1975, Ser. No. 574,557
Int. Cl.² A01D *45/02*
U.S. Cl. 56—119 **9 Claims**



1. In a multi-row crop harvester having at least one forwardly extending gathering member adapted to move between a pair of adjacent rows of row planted crops as the harvester advances and including a hood-like downwardly and forwardly inclidned shield structure on top of the gathering member with opposite forwardly converging sides, the combination therewith of an improved shield extension mounted on the shield structure and comprising: an inverted generally U-shaped support having opposite generally upright legs and a transversely extending bight portion; a pair of laterally spaced attachment means on the shield structure respectively adapted to removably mount the lower ends of the support legs on the shield structure; a front panel member mounted on and extending downwardly and forwardly from the support and having a lower edge adjacent the top of the shield structure forwardly of the support; and latch means operative between the top of the shield structure and a lower, forward portion of the front panel for releasably locking the pabel to the shield structure.

4,037,394

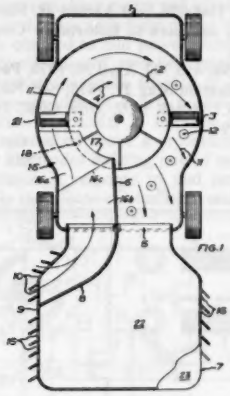
GRASS EJECTION SYSTEM FOR MOTOR-DRIVEN LAWN MOWERS

Sture Lindblad, Tranas, Sweden, assignor to Stiga AB, Tranas, Sweden

Filed June 25, 1975, Ser. No. 590,166
Claims priority, application Sweden, June 26, 1974, 7408456
Int. Cl.² A01D *35/22, 53/06*
U.S. Cl. 56—202 **6 Claims**

1. A grass transport and ejection system for a motor driven lawn mower including a wheeled casing having a top wall and downwardly depending side walls defining an open-bottomed housing for a rotary cutting means equipped with means for generating an air stream for carrying grass cuttings out of the mower casing, and an opening in one side wall of the mower casing, the improvement comprising a baffle mounted within said housing adjacent said opening and extending inwardly therefrom and dividing the interior portion of the casing adjacent said opening into a suction air channel defined by one side of said baffle, said top wall, and a portion of the side wall of the

casing adjacent one side of the opening, and an ejection channel defined by the other side of the baffle, said top wall of the



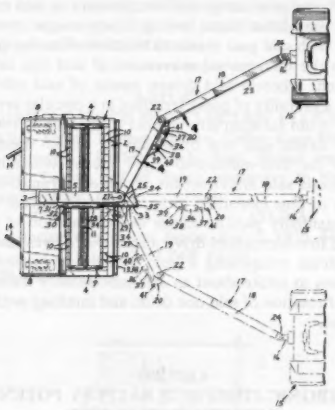
casing and a portion of the side wall of said casing adjacent the other side of the opening.

4,037,395

TRACTOR PULLED CROP HARVESTER

Larry L. Henkensiefken, Waseca; Glenn G. Kanengieter, Blooming Prairie; T. Herbert Morrell, and Thomas N. Storm, both of Owatonna, all of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Mar. 24, 1976, Ser. No. 669,865
Int. Cl.[2] A01D *75/14*
U.S. Cl. 56—218 **5 Claims**



1. A tractor pulled crop harvester comprising:

a. a wheel supported frame having a generally centrally located transverse frame member extending in the direction of travel of the frame;

b. a harvesting mechanism mounted in said frame below said transverse frame member and rearwardly of the forward end of said transverse frame member;

c. a draft tongue which comprises front and rear tongue sections, each having front and rear ends, characterized by means pivotally securing the front end of said rear section to the rear end of said front section on a generally vertical axis, and means for imparting pivotal movement to one of said sections relative to the other thereof and for holding said sections in different positions of swinging movement relative to each other;

d. pivot means connecting said rear end of said rear tongue section of said draft tongue to said frame by pivotal attachment to the forward end of said transverse frame member for swinging movements of said draft tongue relative to said frame on an axis parallel to the axis of swinging movement of said front and rear tongue sections;

e. means on the front end of said front tongue section of said draft tongue for pivotal connection on a generally vertical axis to a tractor hitch; and

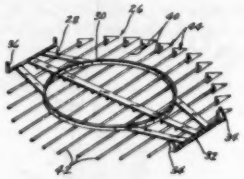
f. power operated means on said frame and draft tongue for imparting said swinging movements to said draft tongue and for holding said draft tongue in desired positions of swinging movement thereof.

4,037,396

BLADE GUARD FOR ROTARY LAWN MOWERS

Wesley F. Buchele, and William I. Baldwin, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 27, 1975, Ser. No. 580,907
Int. Cl.[2] A01D *75/20*
U.S. Cl. 56—255 **7 Claims**



1. In a mower device,

a wheel-supported mower cowling having an open bottom,

a horizontal elongated cutting blade disposed within said cowling,

said blade having sharpened cutting ends and an unsharpened center portion,

means operatively secured to said cowling for supporting and rotating said blade,

guard means secured to and covering the open bottom of said cowling,

said guard means including a plurality of spaced-apart elongated members extending longitudinally in the intended direction of travel of said mower device, said elongated members having rearward and forward ends, said elongated members having pointed members at their forward ends which extend forwardly of the forward end of said cowling,

each of said pointed members comprising a flat, vertically disposed member having a horizontally disposed lower edge portion and a top portion extending upwardly and rearwardly from the forward end of said lower edge portion,

the forward end of said cowling having a plurality of spaced-apart openings extending upwardly from the lower edge thereof, the rearward end of said pointed members being positioned in said openings.

4,037,397

LAWN RAKES

Donald Fiorentino, 8 Skytop Road, Edison, N.J. 08817

Filed Sept. 8, 1976, Ser. No. 721,281
Int. Cl.[2] A01D *7/10*
U.S. Cl. 56—400.12 **3 Claims**

1. A combination rake and pickup device comprising:

a. a first rake head including a plurality of first tines,

b. said first tines include a plurality of first free ends extending outwardly from each of said first tines,

c. an elongated handle extending from said first rake head, said elongated handle being of sufficient length to permit normal use of said first rake head and having a cavity extending therethrough,

d. said handle includes:

1. a bracket having said cavity therein,

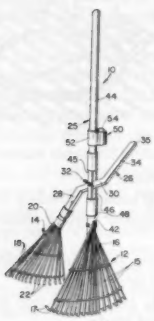
2. a lower handle portion connected to said first rake head at one end thereof and said bracket at the other end thereof, and

3. an upper handle portion connected to said bracket at one end thereof with the opposite end thereof adapted to be gripped by the user of the device,

e. a second rake head oppositely disposed to said first rake head on one side thereof and including a plurality of second tines,

f. said second tines terminate above said first free ends and include a plurality of second free ends shorter than said first free ends and extending inwardly towards said first tines,

g. an elongated support member extending from said second rake head and having an intermediate section crossing said handle and an arm disposed on the opposite side of said handle and adapted to be gripped by the user of the device,



h. said support member includes:

1. a base section connected at one end thereof to said second rake head,

2. said intermediate section angularly disposed relative to said base section and connected at one end thereof to the other end of said base section, said intermediate section crossing said handle through said cavity and pivotably secured thereto by said pivot means, and

3. said arm connected to said intermediate section at one end thereof and extending upwardly therefrom,

i. pivot means removably coupling said intermediate section below said arm to said handle such that manual positioning of said arm moves said second rake head between a closed position with said first and second tines extending in substantially parallel spaced apart relationship to each other to an open position with said first and second tines spaced from each other,

j. said pivot means includes a fastener extending transversely through said bracket and said intermediate section and adapted to be removed therefrom for independent use of either said first rake head or said second rake head, and

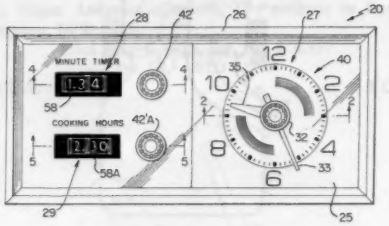
k. latching means coupled to said handle and adapted to releasably engage said arm so as to obtain retention of said arm relative to said handle in the closed position of the rake and permitting manual release therefrom for movement of said second tines relative to said first tines.

4,037,398

DIGITAL TIMER AND TIME INDICATOR DRUMS THEREFOR

Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 465,707, April 30, 1974, Pat. No. 3,899,872.
This application May 27, 1975, Ser. No. 580,598
Int. Cl.[2] G04F *3/02, 3/04;* G04C *23/12*
U.S. Cl. 58—22.9 **8 Claims**



1. In a digital timer having timer means carried by a frame means and setting means to set a selected period of time of said timer means operatively associated with means for interconnecting drive means and said timer means together to cause said drive means to drive said timer means for only said set period of time, said timer means comprising shaft means carried by said frame means and a pair of indicator drums rotatably mounted to said frame means by said shaft means, said drums having means cooperating together so that one of said drums will cause incremental movement of the other drum in a timed relation to incremental movement of said one drum, said cooperating means comprising a pinion-like gear means rotatably mounted to said frame means intermediate said drums, said one drum having drive means operatively associated with said gear means to drive the same as said one drum is rotated, said other drum having driven means operatively associated with said gear means to be driven thereby in a timed relation to the incremental movement of said one drum, the improvement wherein said driven means of said other drum comprises a plurality of pins extending in a circular array from said other drum substantially parallel to the axis of rotation of said other drum, said one drum having driven means to be driven by the first-mentioned drive means when interconnected thereto, said driven means of said one drum comprising a plurality of pins extending in a circular array from said one drum substantially parallel to the axis of rotation of said one drum, said first-mentioned drive means that drives said pins of said one drum comprising a gear rotatably mounted to said frame means to rotate about an axis substantially transverse to said axis of rotation of said one drum and meshing with certain of said pins.

4,037,399

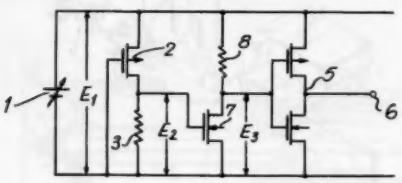
ELECTRONIC TIMEPIECE BATTERY POTENTIAL DETECTING CIRCUITRY

Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,347
Claims priority, application Japan, Sept. 24, 1974, 49-109808
Int. Cl.[2] G04C *3/00;* G08B *21/00*
U.S. Cl. 58—23 BA **40 Claims**

1. In an electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to the said timekeeping signal, the improvement comprising a DC power source for energizing said oscillator, divider and display means, said power source means being adapted to produce an

effective potential for such energizing, and electronic switching means for detecting the effective potential produced by said power source means, said electronic switching means including first stage switching means and second stage switching means, said first stage switching means including a first control electrode coupled to said power source for detecting the effective potential thereof, said first stage means further including two further electrodes adapted to define a closed current circuit having one of a first positive and negative current temperature coefficient in response to said control electrode being referenced above a predetermined potential, said two further electrodes defining one of an increased and decreased impedance in response to said control electrode detecting a drop in the effective potential of said power source,



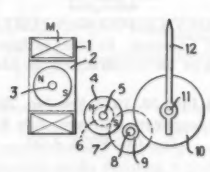
and said second stage switching means having a control electrode coupled to one of said first stage means further electrodes for detecting the potential thereof when same defines a closed current path, said second stage further including two further electrodes defining a closed circuit having one of a positive and negative second temperature coefficient opposite to said first current temperature coefficient in response to said control electrode being referenced below said predetermined potential, said two further electrodes of said second stage means defining a circuit for compensating for changes in one of said increased and decreased impedance of said two further electrodes of said first stage means due to changes in temperature when said second stage swithcing means control electrode detects a change in the effective potential of said first stage switching means further electrodes.

4,037,400

DRIVE DEVICE FOR ELECTRIC CLOCK

Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kozo Sato, Chiba; Nobuo Shinozaki, Chiba; Yoichi Seki, Shisui, and Yuzuru Takazawa, Togane, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 6, 1976, Ser. No. 674,303
Claims priority, application Japan, Apr. 7, 1975, 50-41970
Int. Cl.[2] G04B *19/30*
U.S. Cl. 58—23 D **3 Claims**



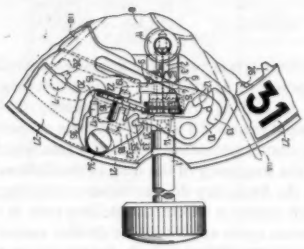
1. A drive device for driving a clock hand of an electric clock comprising: a polarized drive rotor having opposite polarity poles rotatably arranged in the magnetic field developed by a coreless field coil; a polarized auxiliary rotor having opposite polarity poles rotatably arranged and magnetically coupled to said polarized drive rotor so as to displace the polarized drive rotor through a suitable angle with respect to the central direction of the magnetic field developed by the coreless field coil whereby an output may be taken out of either one of said polarized drive rotor and polarized auxiliary rotor so as to drive the clock hand; and means for alternately applying an exciting current of opposite polarities to said coreless field coil to drive said polarized drive rotor and thereby drive said polarized auxiliary rotor due to the magnetic coupling between said two rotors to thereby move the clock hand at stepwise intervals.

4,037,401

APPARATUS FOR ADJUSTING A DATE RING OF A WATCH

Wolfgang Ganter, and Gunter Scholz, both of Schramberg, Germany, assignors to Firma Gebruder Junghans GmbH, Germany

Filed Jan. 15, 1976, Ser. No. 649,238
Claims priority, application Germany, Jan. 22, 1975, 2502380
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 **17 Claims**



1. In a timepiece having a drive spring; indicator hands; a date ring; an operating shaft arranged for winding said spring, adjusting said hands, and adjusting said date ring; a date control gear on said shaft; a correcting gear having a correcting gear shaft and being in continuous engagement with said date control gear, said correcting gear being shiftable into driving connection with said date ring; and an adjusting lever for releasably retaining said operating shaft in control positions for winding said spring, adjusting said hands, and adjusting said date ring, the improvement wherein:

said date control gear is slidable and non-rotatable relative to said operating shaft;

said date control gear operates independently of winding of said spring and adjusting of said hands;

said correcting gear being mounted for rolling movement along a stationary wall toward said date ring in response to being rotated in a selected direction by said control gear; and

control lever means being operably connected to said operating shaft for being shifted relative to said correcting gear in response to movement of said shaft between said control positions;

said control lever having a stop portion disposed in the path of travel of said correcting gear toward said date ring when said operating shaft is at least in a position for winding said spring, to prevent shifting of said correcting gear into driving relationship with said date ring;

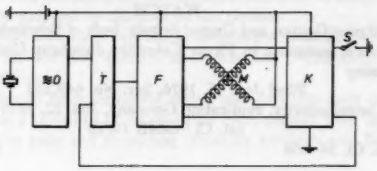
said stop portion being disposed out of the path of travel of said correcting gear toward said date ring when said operating shaft is in a date adjusting position to permit shifting of said correcting gear into driving relationship with said date ring.

4,037,402

CIRCUIT ARRANGEMENT FOR A QUARTZ CONTROLLED ELECTRICAL CLOCK

Paul Sieber, Heilbronn-Bockingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 12, 1975, Ser. No. 557,879
Claims priority, application Germany, Mar. 29, 1974, 2415291
Int. Cl.[2] G04B 27/00
U.S. Cl. 58—85.5 6 Claims



1. In a circuit arrangement for a quartz-controlled electric clock composed of an oscillator stage producing a train of oscillations at a fixed frequency, frequency divider means having an input connected to receive a train of oscillations and at least one output providing pulses at a rate which is a fixed fraction of the frequency of the train of oscillations connected to its input, the frequency divider means containing switchable means which assume a different switching state in responce to each oscillation cycle applied to the divider means and which cause a pulse to be applied to each divider means output upon assuming a selected switching state, and a stepping switch motor having drive coils connected to the divider means output for receiving the pulses in order to effect driving of the motor, the improvement wherein said switchable means remain in their existing switching state upon termination of delivery of oscillations to said divider means input, and said arrangement comprises:

a gate circuit connected between said oscillator stage and said frequency divider means input and having a control input, said gate circuit passing the train of oscillations from said oscillator stage to said frequency divider means input when a first control signal is present at said control input and blocking passage of such oscillations when a second control signal is present at said control input;

control logic means having inputs connected to said frequency divider means to receive signals indicating the switching state of said switchable means, an output connected to said control input of said gate circuit to supply control signals to said control input, and an external control input, said control logic means being arranged to normally apply the first control signal to said control input and to monitor the switching state of said switchable means in a manner such that after application of an external control signal to said external control input, the second signal is produced at said logic means output only at the instant when said switchable means assumes that switching state which immediately precedes the selected switching state at which a pulse is applied to said divider means output, there being no current flow through said driving coils when said switchable means are in such immediately preceding state; and

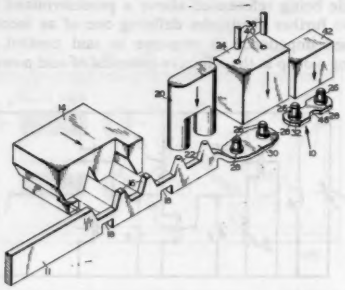
switch means connected to said logic means external control input and switchable into a condition for applying the external control signal thereto.

4,037,403

METHOD OF MAKING INTEGRATED TIE STRAP AND RIVET ASSEMBLIES FOR SAW CHAINS

Donald D. Lanz, and Ronald E. Hencye, both of Oregon City, Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 613,168, Sept. 15, 1975. This application Oct. 18, 1976, Ser. No. 733,258
Int. Cl.[2] B21L 9/02
U.S. Cl. 59—8 6 Claims



1. The method of making integrated tie strap and rivet assemblies for saw chains comprising:

a. Providing a length of elongate bar,

b. Supporting the elongate bar in a longitudinal orientation,

c. Rough cutting the elongate bar to form trapezoidal blanks on its upper portion,

d. Coning the trapezoidal blanks to form partial frustro-conic protrusions,

e. Coining the elongate bar to form rivets and concentric shoulders from the partial frustro-conic protrusions, and a flat base from the remainder of the elongate bar, and

f. Trimming the flat base to form a tie strap.

4,037,404

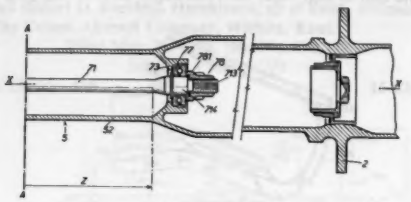
COUPLING DEVICE FOR GAS TURBINE ENGINE

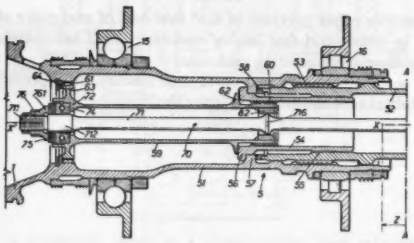
Georges Bougain, Crisenoy, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Evry, France

Filed June 30, 1976, Ser. No. 701,418
Claims priority, application France, July 9, 1975, 75.21500
Int. Cl.[2] F02K 3/00
U.S. Cl. 60—223 5 Claims

1. A gas turbine engine comprising a compressor and an expansion turbine of which the respective rotors are axially spaced one with respect to the other along the longitudinal axis of the engine and which are rigidly connected both in rotation and in axial traction by a main coupling device and a safety coupling device interconnecting the said rotors solely in axial traction but permitting them to turn one with respect to the other in case of accidental rupture of the main coupling device, the said safety coupling device comprising an axial rod supported, adjacent its both extremities, against two abutments

axially facing away from each other and being radially connected with the main coupling device by means of members





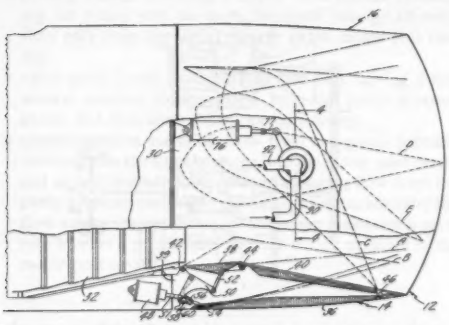
having low coefficient of friction, which permit relative movement of rotation between the said abutments and the said rod.

4,037,405

TWO DIMENSIONAL NOZZLE WITH ROTATING PLUG

Edward A. Huenniger, East Hartford, Conn., and Robert M. Spurrell, Auburn, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 30, 1975, Ser. No. 618,091
Int. Cl.[2] F02K *1/12*; F02C *7/18*
U.S. Cl. 60—229 **14 Claims**



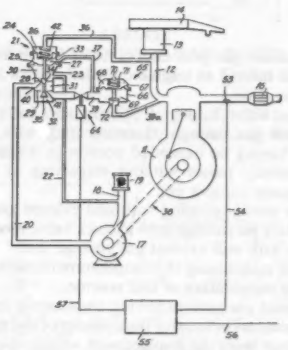
1. In combination with a turbine type power plant that generates hot gases for developing thrust, means including a two dimensional nozzle having opposing parallel side walls and opposing collapsible walls defining a box shaped exhaust gas passage for obtaining horizontal thrust, rotatable plug means extending between said parallel side walls in said nozzle, said collapsible wall includes at least three panels each of said panels extending across said parallel side walls, a pair of said panels extending into said nozzle and pivotally connected to each other to define the throat of said nozzle, and the other panel hingedly connected to the end of one of said pairs of panels, means for controlling said collapsible walls to form a variable throat and means for rotating said plug to form with said collapsible walls a blockage of said nozzle, and additional means for controlling said plug and said collapsible walls so that one of said collapsible walls cooperates with said plug to form a blockage and the other wall defines a thrust vectoring and exhaust gas metering nozzle.

4,037,406

APPARATUS FOR THE PREDETERMINED ADDITION OF SECONDARY AIR FOR THE OPTIMUM COMBUSTION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Günter Hiirtel, Parkstrasse 16, 4041 Rosellen, Germany

Division of Ser. No. 356,193, May 1, 1973, Pat. No. 3,931,710.
This application Oct. 22, 1975, Ser. No. 624,826
Claims priority, application Germany, Nov. 10, 1972, 2254961
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—276 **6 Claims**

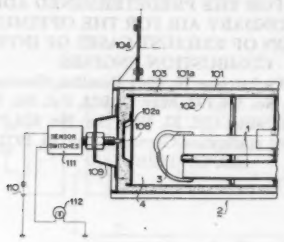


1. Apparatus for the proportionate addition of secondary air to the inlet of an internal combustion engine for effecting optimum combustion and after-burning of the exhaust gases from the internal combustion engine, said apparatus comprising an engine-driven air pump; control means for introducing predetermined quantities of secondary air to the engine; means including a sensor located externally of said control means and responsive to at least one of a plurality of engine operating conditions for regulating said control means; said control means including means for the withdrawal of a portion of the secondary air conveyed through said control means and conducting said withdrawn secondary air to the suction side of said air pump, said air pump returning said secondary air from the pressure side of said air pump to said control means; means for determining the rate of feed of the secondary air and the quantity of the air portion withdrawn from said control means to said air pump, and means including two spaced conical valve means controlling flow passages through said control means, said valve means being mounted on a common actuating control rod and being positioned so that, during an increase of the fed quantity of secondary air, the quantity of the withdrawn air portion is reduced, said actuating control rod for said conical valve means being rigidly connected to two spaced upper and lower membranes having unequal operative surfaces, said membranes defining therebetween a first control pressure chamber, and a second control pressure chamber located above the upper membrane communicating with the suction inlet of said engine and secondary air control valve means coupled to said control means for receiving pumped secondary air therefrom for supplying the secondary air to said engine inlet while maintaining constant pressure in said first control pressure chamber.

4,037,407
EXHAUST GAS PURIFICATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yukio Mizuno, Tachikawa, and Midori Hiramoto, Tanashi, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,157
Claims priority, application Japan, Nov. 28, 1974, 49-137321
Int. Cl.[2] F01N *3/00, 7/00*
U.S. Cl. 60—277 **1 Claim**



1. An exhaust gas purification system for internal combustion engines having an engine cylinder and an intake system thereto, comprising

an exhaust valve having an opening area,

an exhaust gas passage communicating with said exhaust valve having no expanded portion in which the exhaust gas thereby passes without stagnating or mixing with subsequent exhaust gas,

a reactor communicating with said exhaust gas passage,

a secondary air passage with a check valve means communicating with said exhaust gas passage, and

means for maintaining the temperature of exhaust gas over a trigger temperature of said reactor,

said exhaust gas passage having a volume at least equal to a displacement volume of the cylinder of the engine and less than four times the displacement volume and said exhaust gas passage having a cross-sectional area less than three times the opening area of said exhaust valve,

said reactor further forms an expanded chamber and includes a double shell structure having an outer shell, and an inner shell with an end plate,

a heat-insulation wall surrounding said expanded chamber between said inner shell and said outer shell, and

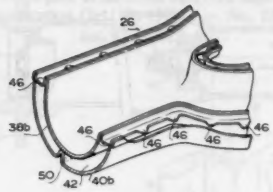
a sensor means having a push rod facing adjacent to said end plate of said inner shell, for being actuated by movement of said end plate to push said push rod when said reactor is substantially excited over the trigger temperature due to engine misfire, whereby sensor switches are activated to send a signal from a power source to a receiving device.

4,037,408
CYLINDER HEAD FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Masahiro Ozawa, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1975, Ser. No. 636,558
Claims priority, application Japan, Dec. 26, 1974, 50-2486[U]
Int. Cl.[2] F01N *7/10*
U.S. Cl. 60—282 **2 Claims**

1. A cylinder head for a multi-cylinder internal combustion engine comprising a block formed with a plurality of exhaust ports, with a common port adapted for connection to an exhaust system and with a plurality of passages communicating at one end with said common port, each of said passages communicating with one of said exhaust ports, a liner disposed in each of said passages, said liner comprising an inner shell and an outer shell, the inner shell being disposed in said outer shell and spaced from the same to form an air layer around said inner shell, said inner shell comprising a first half and a second half secured with each other and, in which said outer shell comprising a first half and a second half secured with each other, said first half of said inner shell has offset portions and said second half of said inner shell has edges thereof engaging the respective offset portions of said first half of said inner shell, in which said first half of said outer shell has offset portions and said second half of said outer shell has edges thereof engaging the

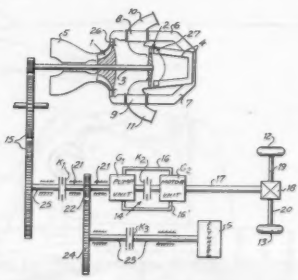


respective offset portions of said first half of said outer shell, and in which said first half of said inner shell has outwardly projecting teeth abutting said outer shell and each of said first and second halves of said outer shell has inwardly projecting protuberances abutting said inner shell.

4,037,409
GAS TURBINE ENGINE FOR VEHICLES

Heinrich Leibach, Grafrath-Wildenroth, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Mar. 2, 1976, Ser. No. 663,072
Claims priority, application Germany, Mar. 6, 1975, 2509670
Int. Cl.[2] F15B *1/02*
U.S. Cl. 60—413 **3 Claims**

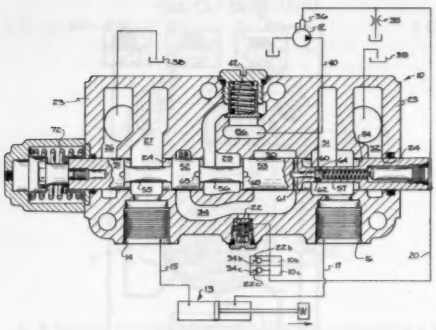


1. Gas turbine engine for vehicles with at least one wheel drive shaft; an infinitely variable transmission for coupling said engine to said wheel drive shaft; a flywheel for storing and releasing braking energy; a disengageable coupling connecting said flywheel with said infinitely variable transmission to said wheel drive, said transmission comprising hydraulic transmission means having a pump unit and a motor unit operable hydraulically be said pump unit, said units being reversible for braking the vehicle, said motor unit being driven by the vehicle's wheels and operating as a pump, said pump unit operating as a motor and driving said flywheel when braking the vehicle, said flywheel being disengaged on the drive side, at the same time as the hydraulic transmission, from the gas-turbine engine by means of said clutch.

4,037,410
HYDRAULIC CONTROL VALVE

Alan D. Jackson, Hutchinson; Homer R. Graber, Pretty Prairie, and Robert D. Krehbiel, Hutchinson, all of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed May 26, 1976, Ser. No. 690,342
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 16 Claims



1. A hydraulic valve in a closed-center load responsive system supplied by a pressure flow compensated variable displacement pump having a flow compensating means:

a valve body;

a bore in the body;

a pump pressure cavity intersecting the bore and connected to the pump discharge;

a motor port cavity intersecting the bore adjacent the pump pressure cavity;

a signal passage intersecting the valve bore intermediate the pump pressure cavity and the motor port cavity, the signal passage connecting with the flow compensating means of said pump;

a craning passage including a check valve therein connecting the motor port cavity to the signal passage allowing flow only from the signal passage to the motor port cavity;

a valve spool means positioned in said bore having a first neutral position blocking flow from the pump pressure cavity and flow from the motor port cavity;

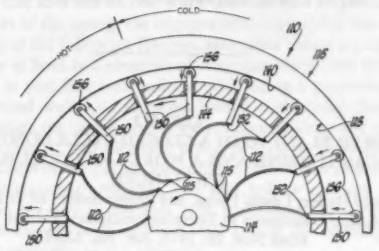
a second position metering flow from the pump pressure cavity across the signal passage into the motor port cavity and an intermediate third position metering flow from the pump pressure cavity into the signal passage, whereby the flow compensating means of the pump maintains a pressure level at a preset level abpve the load pressure in the motor port cavity.

4,037,411
THERMAL ENERGY CONVERTING ASSEMBLY

Peter A. Hochstein, 14020 15 Mile Road, Sterling Heights, Mich. 48077

Filed Feb. 2, 1976, Ser. No. 654,368
Int. Cl.[2] F03G *7/06*
U.S. Cl. 60—527 28 Claims

1. A thermal energy converting assembly comprising: a plurality of temperature sensitive elements made of material which undergoes thermoelastic, martensitic phase transformation; reaction means for supporting said elements; cam means reacting with said elements for straining said elements during a first phase and allowing the unstraining of said elements during a second phase, and support means supporting said reaction means and said cam means for allowing relative movement between said elements and said cam means to extract energy as

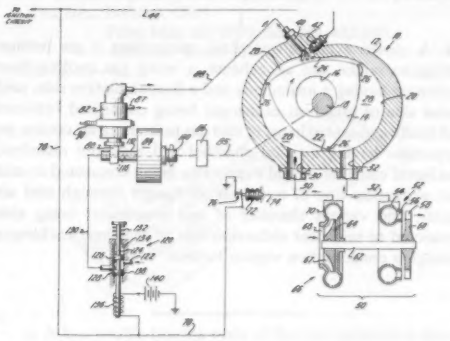


said elements react with said cam means during said unstraining of said elements.

4,037,412
COMPOUND SPARK-IGNITION AND DIESEL ENGINE

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 9, 1975, Ser. No. 621,234
Int. Cl.[2] F02B *33/44, 33/42, 69/00, 53/04*
U.S. Cl. 60—605 10 Claims



1. A compound rotary engine comprising:

a. an outer body having an internal cavity, the peripheral surface of which has a multi-lobe profile, said outer body also having an air intake passage and a combustion gas exhaust passage;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said multi-lobe surface to define a plurality of working chambers which vary in volume in response to said relative rotation, the volumetric compression ratio of said working chambers being substantially less than that required for diesel-type operation;

c. a fuel nozzle mounted on said outer body for discharging fuel into each working chamber after the air charge therein has been substantially compressed;

d. ignition means for igniting fuel discharged into each working chamber by said fuel nozzle such that the engine is capable of operating with diesel-type fuels as a spark-ignited engine; and

e. a supercharger driven by the engine exhaust gases discharging from said exhaust passage for supplying compressed air to said air intake passage, the supercharger output pressure being incapable below a predetermined engine power output, which is significantly above idling output, of raising the compression pressure in said working chamber to a value high enough for diesel-type opera-

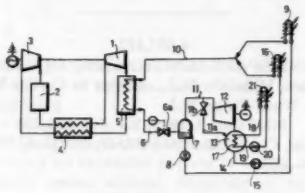
tion but at higher engine power outputs being capable of raising the compression pressure in said working chambers to a value high enough for diesel-type operation.

4,037,413

POWER PLANT WITH A CLOSED CYCLE COMPRISING A GAS TURBINE AND A WORK GAS COOLING HEAT EXCHANGER

László Heller; László Forgó, and Zoltán Szabo, all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Hungary

Filed Nov. 26, 1975, Ser. No. 635,451
Claims priority, application Hungary, Dec. 9, 1974, HE 670
Int. Cl.[2] F01K *23/04*
U.S. Cl. 60—655 6 Claims



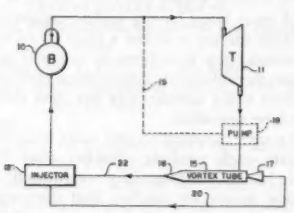
1. A closed cycle power plant, comprising a gas turbine having an intake and an exhaust, a work gas cooling heat exchanger having a heater side and a heat abduction side, said heater side of said heat exchanger being connected between said intake and said exhaust of said gas turbine, an air cooler, an evaporator having a liquid chamber and a vapour chamber, said liquid chamber of said evaporator being connected to said heat abduction side of said heat exchanger through said air cooler, said vapour chamber of said evaporator being also connected to said heat abduction side of said heat exchanger through a condensation vapour turbine.

4,037,414

LIQUID/VAPOR ENERGY CYCLE

Carl D. Nicodemus, 176 Meigs St., Rochester, N.Y. 14607

Filed July 23, 1976, Ser. No. 708,124
Int. Cl.[2] F01K *19/00*
U.S. Cl. 60—670 10 Claims



1. In a liquid/vapor energy cycle including means for heating a said liquid in a boiler to produce said vapor and a transducer driven by said vapor, the improvement comprising:

a. a vortex tube arranged for receiving the output from said transducer and dividing said transducer output into relatively hot and cold portions; and

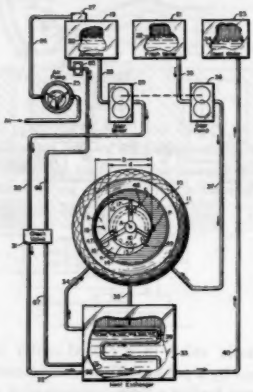
b. an injector powered by said vapor and arranged for pumping said cold portion into said boiler.

4,037,415

IMPLOSION ROTARY ENGINE

Albert S. Christopher, 2269 Hyland, and Robert J. Tufts, P.O. Box 3088, both of Ventura, Calif. 93003

Continuation-in-part of Ser. No. 524,078, Nov. 15, 1974, Pat. No. 3,975,914. This application July 6, 1976, Ser. No. 702,748
Int. Cl.[2] F01K *25/06, 25/10*
U.S. Cl. 60—673 8 Claims



1. An implosion rotary engine including, in combination:

a. a first member having an inner annular wall of given diameter defining a circular cavity;

b. a second member having an outer annular wall of outside diameter smaller than said given diameter eccentrically positioned in said cavity with respect to the center of said cavity so as to be in tangential engagement with said inner wall at one point whereby a crescent shaped volume is defined between said inner annular wall and outer annular wall;

c. at least one movable vane in said second member radially extending from its outer annular wall to engage said inner annular wall and divide said crescent shaped volume into first and second volumes on opposite sides of said vane, said members being mounted for relative rotation about an axis passing through the center of said second member so that said vane reciprocates in and out as it passes said one point of tangency and said volumes sequentially increase and decrease in size;

d. a gas container holding a given gas under at least 2 atmospheres of pressure;

e. a liquid container holding a given liquid for which said gas has a chemical affinity;

f. a used liquid container;

g. gas inlet means connected between said gas container and the members for sequentially introducing said given gas into said first and second volumes only when they are increasing in size;

h. liquid inlet means connected between said liquid container and said members for sequentially introducing liquid into said first and second volumes only when they are decreasing in size;

i. outlet means connected between said used liquid container and said members for sequentially passing liquid which has absorbed said given gas from said volumes as said volumes reach minimum sizes; and

j. a heat exchanger housing for effecting heat exchange between used liquid passing from said outlet means to said used liquid container and incoming gas from said gas container, heat being generated by absorption of said gas in said liquid whereby gas introduced to the members expands the volume receiving the gas and water intro-

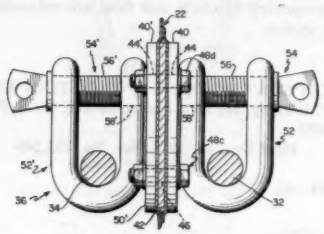
duced into said volume when the members reach a relative rotative position such that the volume starts decreasing absorbs said gas to create a vacuum contracting said volume so that relative rotation of said members is sustained.

4,037,416

CABLE CONNECTOR ASSEMBLY FOR OIL BOOM

Paul Preus, Smith Road, Toms River, N.J. 08753

Filed May 17, 1976, Ser. No. 687,215
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **2 Claims**



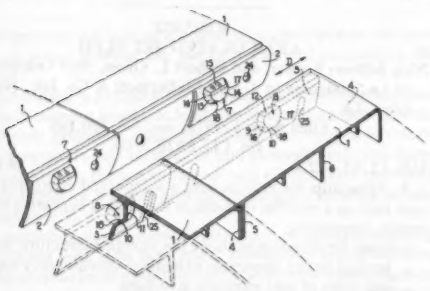
1. A barrier for water carried pollutants comprising a series of end to end connectable boom sections, each boom section comprising a flexible tubular sleeve containing a flotation means and a depending skirt, flexible draft members extending along each side of the skirt immediately below the tubular sleeve and means connecting the flexible draft member to the skirt at spaced intervals characterized in that the connecting means comprise a pair of rigid plates, one of said pair of plates being positioned on one face of said skirt and the other of said pair of plates being positioned on the opposite face of said skirt, means rigidly joining said pair of plates through the skirt, and an anchor shackle secured to the outer face of at least one of the pair of plates, said anchor shackle being of generally U-shaped configuration and secured to the outer face of said plate with the legs of the U-shaped shackle directed upwardly to thereby receive the flexible draft member between the legs, and a closure pin releasably closing the extended ends of the legs and securing the flexible draft member to the anchor shackle.

4,037,417

VOUSSOIR FOR A CASING

Jacques Oger, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Mar. 19, 1975, Ser. No. 560,013
Claims priority, application France, Mar. 22, 1974, 74.10002
Int. Cl.[2] E21D *11/22*
U.S. Cl. 61—45 R **8 Claims**



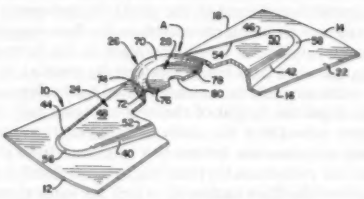
1. In a casing voussoir comprising a web in the general shape of a sector of a cylindrical ring and at least a first juxtaposition wall and a second juxtaposition wall which are substantially perpendicular to said web and substantially radial relative to the axis of the cylindrical ring, guide means for the juxaposition of said first and second walls between two neighbouring voussoirs of the casing; the improvement comprising the combination of the following features, said guide means are constituted by at least two elements of conjugate shape, one being a hollow in said first wall and the other being a projection on said second wall, said elements having a clearance therebetween when the two voussoirs are juxtaposed along said walls, at least one of said elements being tapered to facilitate the introduction of the projection in the hollow when assembling said neighbouring voussoirs, and said hollow element comprises an opening in the first wall surrounded by a portion which is integral with said first wall around the opening and projects inwardly of the voussoir.

4,037,418

LOAD SUPPORTING BEARING PLATE

John I. Hannan, Shadyside, Ohio, assignor to Phillips Stamping Co., Inc., Bellaire, Ohio

Filed May 12, 1976, Ser. No. 685,695
Int. Cl.[2] E21D *21/00*; F16B *29/00*
U.S. Cl. 61—45 B **32 Claims**



1. A low profile bearing plate of the type adapted to provide support for a generally planar surface, said plate comprising:

a generally flat body having a length greater than the width with a longitudinal axis extending between the body ends and a transverse axis extending between the body sides with said axes intersecting at substantially the midpoint of said body, one face of said flat body defining a generally planar plate bearing surface adapted to be closely received against a generally planar surface; an elongated major embossed area extending outwardly from the other face of said body and being located so as to extend along said longitudinal axis over a major portion of the body length; the height of said major embossed area being such that said plate defines a relatively low profile; a recessed area extending inwardly from the outer surface of said major embossed area back toward said plate bearing surface and being coaxially disposed relative to the intersection of said body axes, said recessed area having a bottom wall disposed generally parallel to and spaced from said plate bearing surface; and, an opening in said bottom wall coaxially disposed with the intersection of said body axes adapted to receive headed fastener means for affixing said support plate to a generally planar surface; the depth of said recessed area being such that when said fastener means is received in said opening, at least a portion of the head of said fastener means is concealed within said recessed area.

4,037,419

MINE ROOF SUPPORT

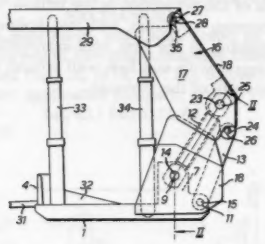
Nigel Hill, and James Anthony Sutton, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Dec. 18, 1975, Ser. No. 641,939

Claims priority, application United Kingdom, Dec. 18, 1974, 54780/74

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D 5 Claims



1. A mine roof support having a floor-engaging part, a roof-engaging part, a shield of substantial width pivotally connected to the roof-engaging part to extend downwardly and rearwardly towards the goaf, a top link whose width is most of the width of the shield pivotally connected by coaxial pivots at its upper corners to the shield for movement about a first axis and pivotally connected by coaxial pivots at its lower corners to the floor-engaging part for movement about a second axis, a bottom link of a narrow width closer to the goaf than the top link, pivotally connected to the shield for movement about a third axis and pivotally connected to the floor-engaging part for movement about a fourth axis close to the floor-engaging surface, all pivot axes being substantially parallel to one another, and extendible strut means carried by the floor-engaging part to adjust the height of the roof-engaging part such that reduction in height of the roof-engaging part towards its lowest position causes the bottom link to extend from the fourth pivotal axis away from the floor-engaging part and close to the goaf side of the floor surface on which the support stands, the width and the connections of the top link locating the shield against any force applied to the shield in a transverse sense which will tend to apply torsion and shear forces to the top link and resisting any tendency for the roof-engaging part to move transversely relative to the floor-engaging part.

4,037,420

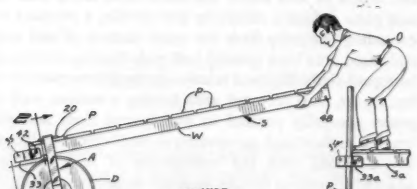
MECHANISM FOR INSTALLATION AND REMOVAL OF A DOCK IN THE WATER

Jack W. Wicks, 1407 Soo Line Bldg., Minneapolis, Minn. 55402

Filed Sept. 5, 1975, Ser. No. 610,529

Int. Cl.[2] E02B *3/20*

U.S. Cl. 61—48 7 Claims



1. A mechanism for installation and removal of a dock section having permanent brackets secured thereto for engagement with dock posts including

a. a pair of temporary brackets,

b. means for releasably connecting said temporary brackets to a dock section adjacent one end thereof,

c. means for releasably engaging the free end of the temporary brackets to a float for supporting the dock section at one end upon the water,

d. means on the other end of the dock section for connection with a support,

e. means for connecting the permanent brackets secured to the dock section to dock posts for permanently supporting the dock section on the dock posts and support whereby the temporary brackets and float are released from the dock section.

4,037,421

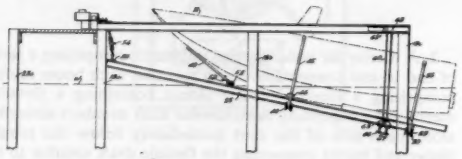
FLOAT-ON BOAT DOCKING AND LIFTING ASSEMBLY

William P. Whitley, Jr., 3001 Industrial Ave. No. 3, Fort Pierce, Fla. 33450

Filed Dec. 22, 1976, Ser. No. 753,549

Int. Cl.[2] B63C *3/06*

U.S. Cl. 61—65 10 Claims



1. A float-on boat docking and lifting mechanism comprising, in combination, a cradle support framework having spaced, parallel, elongated members and being open at one end to permit entry of a water craft, means for supporting said framework members in a substantially common, horizntal plane and in vertical spaced relation above a body of water, an elongated float-on boat cradle between and below said framework members, means pivotally securing one end of said boat cradle at a central position between the other ends of said cradle support framework members at a location above the surface of the body of water, a reversible winch mechanism having a pair of axially aligned winding drums, means mounting said winch mechanism so that the axis of rotation of said winch drums is centrally located between said other ends of said framework members and extends longitudinally therebetween, a first cable means secured at one end to one of said winch drums, pulley sheave means directing said first cable for passage along one side of one of said framework members from said other end to said one end thereof, and means controlled by movement of said first cable means along said one of said framework members in one direction or the other, selectively, for raising or lowering the other end of said boat cradle.

4,037,422

ARTICULATED JET SLED

Nico deBoer, Kenner, and Robert L. Olsen, New Orleans, both of La., assignors to J. Ray McDermott & Co. Inc., New Orleans, La.

Filed Sept. 4, 1975, Ser. No. 610,105

Int. Cl.[2] E02F *5/06*

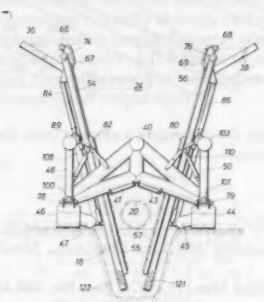
U.S. Cl. 61—72.4 24 Claims

1. Apparatus for entrenching a submerged elongated structure such as a pipeline or cable in the subsoil beneath a body of water, comprising:

a frame for disposition above the elongate structure; first and second jet leg apparatus extending downwardly on opposite sides of said elongate structure;

said first and second jet leg apparatus each being mounted on the frame for pivotal movement about an axis parallel to the elongate structure, with the center of gravity of each apparatus being inboard of the pivot axis; and

positioning means for pivoting said first and second jet leg apparatus about said pivot axes to move said jet leg apparatus from a substantially vertical attitude to an attitude wherein the lower end of each jet leg is below and beneath the elongate structure to form a trench within the subsoil to accommodate the elongate structure;



said positioning means serving to apply a restraining force to said jet legs to maintain the lower ends thereof below and beneath the elongate structure, with the lower ends of said jet legs being free to swing outwardly upon the release of the restraining force.

4,037,423

PROCESS FOR PRODUCING A CONNECTING CONSTRUCTION UNIT, SUCH AS A QUAY, CONTAINER OR PLATFORM

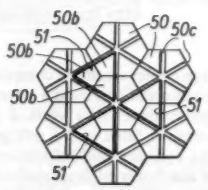
Einar Knutsen, Astrupsvei 36, 5032 Minde, Norway

Filed Sept. 4, 1975, Ser. No. 610,431

Claims priority, application Norway, Sept. 26, 1974, 743469

Int. Cl.[2] E02B *3/20*; E02D *5/20*

U.S. Cl. 61—87 **8 Claims**



1. A process for making a connecting construction unit on a body of water without the use of docks and comprising the steps of

a. providing a plurality of floatable construction elements, each element having at least two intersecting slots therein, said slots extending cross-wise of said element and intersecting opposite side surfaces of said element, said slots opening through the top surface of said element and extending vertically in a major part of the height extension of said element,

b. assembling the floatable construction elements in abutting relation with slots in adjacent elements in lateral communication to form a continuous network of intersecting slots and including positioning reinforcing means in said slots to form a reinforced semi-rigid raft construction,

c. filling said network of slots with water-proof molding material while said raft construction is floating on the water and imbedding said reinforcing means therein to form a substantially rigid raft construction having a network of reinforced skirt-formed walls,

d. and forming a connecting construction on the reinforced rigid raft construction.

4,037,424

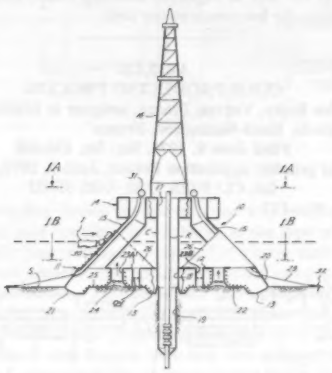
OFFSHORE DRILLING STRUCTURE

Edward O. Anders, Houston, Tex.

Continuation-in-part of Ser. No. 619,400, Oct. 3, 1975. This application June 23, 1976, Ser. No. 698,839

Int. Cl.[2] B63B *35/44, 21/27*

U.S. Cl. 61—98 **26 Claims**



1. An offshore drilling structure, comprising a hull adapted to float on the water surface, during transit, and having ballast compartments which permit it to be raised and lowered within the water, when at a drilling site, a working platform supported above the hull, said platform and hull having openings therethrough to pass drilling equipment between the platform and the subsurface, the bottom of the hull having a recessed area about the opening in the hull, said hull having holes connecting said recessed area with its top, and a thruster mounted within each hole for reducing the pressure within the recessed area so that, when the hull is supported on the subsurface, soil from the subsurface may be drawn into the recessed area.

4,037,425

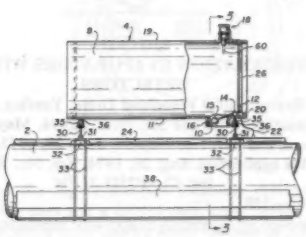
BUOYANCY APPARATUS

Harry Berg, Abbotsford, Canada, assignor to H. B. Contracting Ltd., Surrey, Canada

Filed June 9, 1975, Ser. No. 584,838

Int. Cl.[2] F16L *1/04*

U.S. Cl. 61—112 **26 Claims**



1. Buoyancy apparatus comprising:

a tank floatable in a body of water and adapted to be connected to a pressure gas line, said tank having gas therein and consequently having a predetermined buoyancy in the water,

an opening in the tank near the bottom thereof to maintain the interior of the tank in communication with said water,

a gas inlet in the tank spaced below the top of the tank and through which gas from said line can be directed into the tank,

normally-closed valve means controlling the gas inlet and normally preventing gas from entering the tank, and

control means connected to the valve means operable to open said valve means and located at said opening, said control means being operated by water flowing through the opening into the tank when the tank is moved downwardly in the water to open valve means and permit gas to enter the tank to expel the entering water, thereby maintaining the buoyancy of the tank.

4,037,426

COLD PRODUCING PROCESS

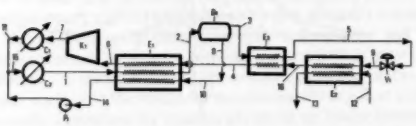
Alexandre Rojey, Vanves, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed June 9, 1976, Ser. No. 694,448

Claims priority, application France, June 9, 1975, 75.18174

Int. Cl.[2] F25B *5/00, 7/00, 39/02*

U.S. Cl. 62—117 **14 Claims**



1. A process for producing cold by evaporation at low temperature of a refrigerating fluid passing from a gaseous state to a liquid state or vice-versa, comprising the steps of (a) compressing, in a compression zone, a gaseous phase of refrigerating fluid so as to obtain a compressed gaseous phase and dissolving it, at least partly, in a liquid solvent phase so as to obtain a solution, transferring at least a portion of the compression heat and of the dissolution heat to an external cooling fluid, (b) cooling the solution from step (a) as indicated in steps (d) and (f), so as to obtain two liquid phases by separation of the mixture constituents, (c) separating the light liquid phase from the heavy liquid phase, (d) placing the heavy liquid phase from step (c) in heat exchanger relationship with the solution to be cooled from step (b) and then sending said heavy liquid phase, as solvent phase, to step (a) for dissolving a further amount of compressed gaseous phase, (e) expanding the light liquid phase and vaporizing it so as to produce cold, (f) placing the vaporized light phase from step (e) in heat exchange relationship with the solution to be cooled from step (b) and feeding back said vaporized light fraction to the compression zone as gaseous phase of the refrigerating fluid.

4,037,427

REFRIGERATION EVAPORATORS WITH ICE DETECTORS

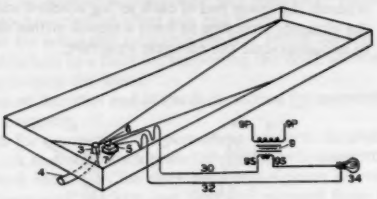
Doris S. Kramer, 2009 Woodland Drive, Yardley, Pa. 19067

Continuation-in-part of Ser. No. 142,694, May 21, 1971, abandoned, and Ser. No. 373,456, June 25, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,309

Int. Cl.[2] F25D *21/04*

U.S. Cl. 62—128 **4 Claims**

1. Improved refrigeration evaporator means for use within a freezing environment comprising in combination an element for cooling air and condensing moisture from the air, drain pan means mounted under the element for receiving only said moisture said pan means having an outlet for discharging the moisture to a drain; wherein the improvement comprises: continuously self-heated resistor sensing means mounted within the drain pan means, said sensing means having a higher temperature in the presence of air and a lower temperature in the presence of ice; and indicating means mounted without the



drain pan means for indicating a change from the higher to the lower temperature.

4,037,428

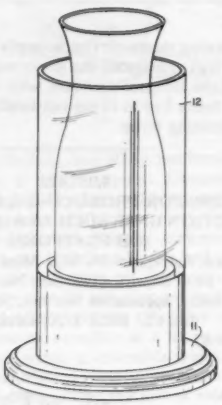
BEVERAGE COOLER ASSEMBLY

Albert J. Giannotti, 800 Live Oak Ave., Menlo Park, Calif. 94025

Filed Mar. 19, 1976, Ser. No. 668,452

Int. Cl.[2] F25D *3/08*

U.S. Cl. 62—371 **9 Claims**



1. A beverage cooler assembly comprising a hollow cylinder adapted to receive and surround a beverage container, a base supporting said cylinder in a vertical position, a removable refrigerant container filled with a refrigerant supported by the base within the cylinder, said refrigerant container having flat parallel upper and lower surfaces and side surfaces which have the same shapes as the hollow cylinder and sized to fit closely adjacent to the inner surface thereof, the upper surface of said container receiving and supporting the beverage container disposed in the hollow cylinder in heat transfer relationship therewith to cool the bottom of the beverage container by conductive cooling and the sides by convective cooling, said removable refrigerant container being removable from the cylinder for recooling and reusing.

4,037,429

ADAPTER UNIT FOR CONVERTING A TWO-WHEEL DRIVE VEHICLE TO A FOUR-WHEEL DRIVE VEHICLE

George Edward Britzius, 4669 Olympia Way, Longview, Wash. 98632

Filed Dec. 11, 1975, Ser. No. 639,883

Int. Cl.[2] F16C *35/00;* **B60K** *17/34*

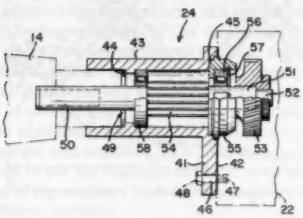
U.S. Cl. 64—4 **4 Claims**

1. An adapter unit for economically converting a two-wheel drive vehicle having a transmission output shaft driving the rear wheels of the vehicle to a four-wheel drive vehicle having

a power transfer unit enclosed in a housing having an access opening to a power input shaft thereof for driving the rear, forward or both forward and rear wheels of the vehicle, the adapter unit coupling the transmission output shaft to the power input shaft of the power transfer unit and comprising:

a housing having a hollow sleeve portion integral with and connected to a rigid plate extending normal thereto, the plate having a machined surface adapted to be connected to said power transfer unit over said access opening,

a drive shaft extending coaxially through said sleeve portion and including means on one end thereof adapted to drivingly engage said transfer unit input shaft and means on the other end thereof adapted to be in driven engagement with said transmission output shaft,



at least one bearing supporting said drive shaft for rotation in said sleeve portion,

a recess in said machined surface of the rigid plate coaxial with said sleeve portion,

a bearing adapter mounted in the recess extending beyond the plane of the machined surface of the adapter plate to be received in the access opening of the power transfer unit,

a bearing supported by said bearing adapter supporting said drive shaft of the adapter unit for rotation, and

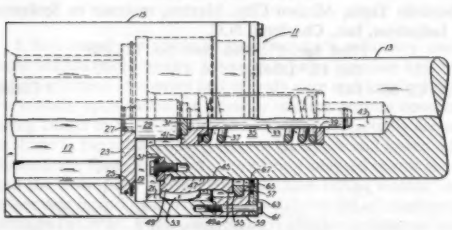
sealing means sealing the adapter unit against environmental damage.

4,037,430

ROLL-END SPINDLE COUPLING

John Wright, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 17, 1975, Ser. No. 632,672
Int. Cl.[2] F16D *3/18*
U.S. Cl. 64—9 R **3 Claims**



1. In a spindle coupling comprising a shaft and a roll end sleeve on one end of said shaft, and resiliant means mounted to said shaft that coacts with a plunger abutting a thrust plate in said sleeve, and a flex hub surrounding the end of said shaft, with carrying means drivingly connecting said sleeve to said shaft, the improvement therewith comprising:

a. first means disposed around said shaft, said first means coacting with and being in continous operable engagement with said flex hub; and

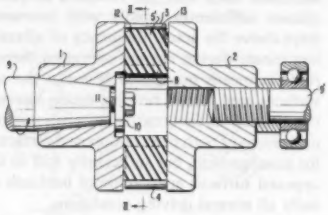
b. second means secured to said sleeve and coacting with and maintaining said first means in continuous operable engagement with said flex hub, said first means and second means cooperating to prevent an external axial force from being applied to the driving or driven machine bearings.

4,037,431

COUPLING DEVICE USED IN ONE-WAY ROTATING DRIVE

Takao Sugimoto, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 19, 1976, Ser. No. 687,813
Claims priority, application Japan, May 20, 1975, 50-67951[U]
Int. Cl.[2] F16D *3/64*
U.S. Cl. 64—14 **2 Claims**



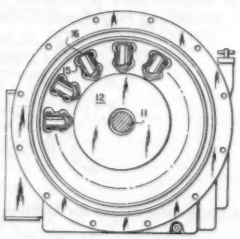
1. In a coupling device for use in a one-way rotatingdrive arrangement, said coupling device being of the type which is composed of a pair of flanges connected to a drive shaft and to a driven shaft respectively, the improvement comprising; at least two pair of claw members, each pair consisting of one claw projecting along the drive shaft axis from one of the flanges and a second claw projecting along the drive shaft axis from the other of said flanges, each said claw member having generally an L-shape with the concave portion facing its paired claw member; and an elastic circular member, having first and second group of radial projections alternately provided on its periphery, mounted between said flanges, each of said first group of radial projections having two convex surfaces mating with the concave surfaces of said pair of claw members, each of said second group of radial projections being substantially smaller and lighter and having a different shape than those of said first group.

4,037,432

RESILIENT DRIVING CONNECTION

Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

Filed Dec. 31, 1975, Ser. No. 645,661
Int. Cl.[2] F16D *3/14*
U.S. Cl. 64—27 L **14 Claims**



1. A resilient driving connection rotatably drivingly connecting a driving part and a driven part, comprising:

a plurality of drive units spaced about the axis of rotation of the parts, each unit comprising a drive member rigid with the driving part and a driven member rigid with the driven part, first opposed surfaces on the driving and driven members through which drive normally occurs, second opposed surfaces on the driving and driven members substantially free of driving forces during normal

drive, but through which force is transmitted upon braking wherein the driven member drives the driving member, both pairs of opposed surfaces extending in planes which are radial or parallel to radial planes so that the driving and driven members can move radially relative to each other to correct for misalignment between the driving and driven parts,

first resilient means interposed between the first opposed surfaces, said first resilient means having means for absorbing energy and becoming stiffer as the driving load increases, such that the resonant frequency thereof increases sufficiently rapidly with increased load that it stays above the actual frequency of vibration of the resilient means during normal operation thereof, and second resilient means interposed between the second opposed surfaces, said second resilient means having a stiffness less than that of the first resilient means so as to permit relative movement of both pairs of opposed surfaces for correcting for misalignment, but sufficiently stiff to keep the second opposed surfaces apart without backlash during substantially all normal driving conditions,

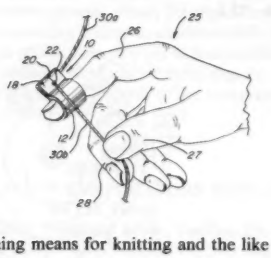
said first resilient means comprising a metallic strip located between the first opposed surfaces and bent so as to normally resiliently engage both of said first opposed surfaces and to at least partially straighten out and become stiffer as the driving load increases, and said second resilient means comprising a metallic strip between the second opposed surfaces arranged to normally space the second opposed surfaces apart from each other while maintaining the first metallic strip in contact with the first opposed surfaces.

4,037,433

HAND KNITTING AID

Blanche V. Weber, 1350 Pontiac, Denver, Colo. 80220

Filed Aug. 28, 1975, Ser. No. 608,581
Int. Cl.[2] D04B *3/04;* B65H *59/14*
U.S. Cl. 66—1 A **2 Claims**



1. Yarn tensioning means for knitting and the like comprising:

a. ring-like support means for mounting adjacent a fingertip of a user;

b. leather flange means upstanding generally radially from said ring-like support means, extending a distance from said support means;

c. there being a bore through said leather means with a rough interior surface to induce friction on yarn passing therethrough; and

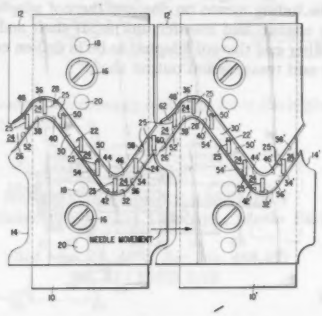
d. there being a slit extending into said flange means providing a yarn ingress to said bore.

4,037,434

CLOSED CAM TRACK FOR A CIRCULAR KNITTING MACHINE

Gerard Durville, Geneva, Switzerland, and Charles Hamilton Wunner, Charlotte, N.C., assignors to The Singer Company, New York, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,802
Int. Cl.[2] D04B *15/32*
U.S. Cl. 66—57 **7 Claims**



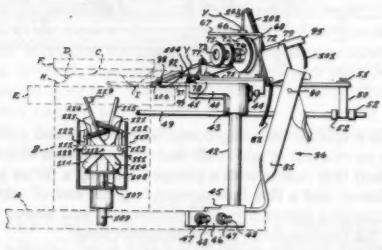
1. Needle actuating camming for a circular knitting machine defining a closed cam track with opposite sides to engage the butts of needles and alternately move the needles repeatedly between cast-off and latch clear positions, the cam track including straight needle raising portions, straight needle lowering portions, and curved bridging track portions between the raising and lowering portions of the track, the bridging portions each having one side defined by a single circular arc which is tangent to a corresponding one side of each of a raising and a lowering portion of the closed cam track, and having an opposite side which is defined by two circular arcs both with a radius equal to the first mentioned circular arc and with one of such two circular arcs tangent to the raising portion of the closed cam track on the side opposite the said one side thereof, the other being tangent to the lowering portion of the track on the side opposite its said one side.

4,037,435

AUXILIARY FEED ATTACHMENT FOR A CIRCULAR KNITTING MACHINE

Everardo Tapia, Mexico City, Mexico, assignor to Speizman Industries, Inc., Charlotte, N.C.

Filed Apr. 17, 1968, Ser. No. 721,988
Int. Cl.[2] D04B *15/54, 23/22, 27/02*
U.S. Cl. 66—142 **3 Claims**



1. An auxiliary yarn feeding attachment for a circular knitting machine of the type that knits a welt-like fabric portion by supporting an initial portion of the fabric above the knitting level until the welt-like portion is completed by knitting the initially supported portion with a subsequent course of the fabric, said attachment comprising an auxiliary yarn feeding

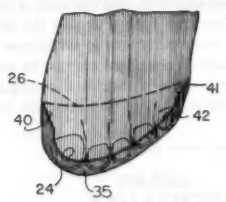
member movably mounted on said circular knitting machine adjacent the needle circle thereof, means for selectively positioning said auxiliary yarn feeding member sequentially in an inoperative withdrawn position at which it retains an auxiliary yarn in a non-feeding disposition, a feeding position at which the auxiliary yarn is fed temporarily to the needle circle for knitting in said welt-like fabric portion, and an intermediate position at which the auxiliary yarn is positioned out of knitting engagement with the needle circle and is drawn by the previously knit portion thereof in a constricting loop around the welt-like fabric portion prior to completion thereof, thereby substantially reducing the tubular size of said welt-like fabric portion at said constricting loop, and auxiliary yarn clamping and cutting means mounted on the circular knitting machine adjacent the needle circle and spaced from said auxiliary yarn feeding member in the direction of needle circle rotation, said clamping and cutting means being operable to hold the leading end of said auxiliary yarn during movement of said auxiliary yarn feeding member to said feeding position for extension of said auxiliary yarn from said clamping and cutting means into engagement with said needle circle to initiate knitting, to release said auxiliary yarn following said initiation of knitting and to cut the trailing end of the auxiliary yarn during movement of the auxiliary yarn feeding member to its inoperative withdrawn position.

4,037,436

TOE CONSTRUCTION AND METHOD FOR SEAMLESS HOSIERY PRODUCTS

Nicholas Wehrmann, Wilkesboro, N.C., assignor to Ithaca Textiles, Inc., Wilkesboro, N.C.

Filed Sept. 2, 1975, Ser. No. 609,783
Int. Cl.[2] A41B *11/02*; D04B *9/46*
U.S. Cl. 66—186 **3 Claims**



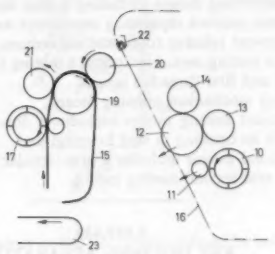
1. In a seamless circular knit product such as hosiery, panty hose anklets, and the like, having a tubular seamless knit foot portion formed of courses knit of body yarn and terminating in an initially open-ended toe portion, said toe portion open end being closed by stitching along a trim line substantially arcuate in shape in the relaxed fabric to provide upper and lower sides thereof, the upper side when worn being adapted to rest above and the lower side to rest below the toes of the wearer, said upper side including courses and partial courses of reinforcing thread of selected length designed to provide a reinforced area having the outer edge thereof defined by said stitched trim line and having the inner edge thereof defined by a boundary line which in the state of the toe portion fabric being relaxed follows a series of connected substantially straight lines and in the worn stretched state assumes a substantially arcuate shape and with a major portion thereof being substantially parallel to said arcuate stitched trim line, said inner edge define by said lines following a semi-hexagonal shape in the relaxed fabric state and adapted to assume an arcuate shape in the stretched fabric shape, said reinforcing thread courses being formed such that said toe portion when worn provides a narrow curved band of reinforced fabric limited to the upper outer extremities of the toes of the wearer, a selected width band of reinforced fabric over the lower extremities of the toes of the wearer and outer edge reinforced portions adapted when worn to provide reinforcement over the ends of all the toes of the wearer.

4,037,437

MACHINE FOR THE PROCESSING OF HIDES AND SKINS

Gerhard Richter, and Peter Pöppel, both of Regensburg, Germany, assignors to USM Corporation, Boston, Mass.

Filed May 26, 1976, Ser. No. 690,053
Claims priority, application Germany, May 28, 1975, 2523555
Int. Cl.[2] C14B *1/06*
U.S. Cl. 69—42 **10 Claims**



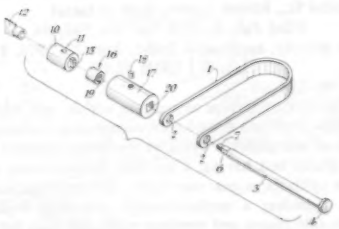
1. A machine for processing hides and skins comprising a frame and first and second processing units mounted in the frame, the first processing unit comprising a first processing member mounted for rotation in the frame, first roller means arranged in the frame to grip the hide or skin inserted in the machine, and means for rotating rollers of the first roller means to draw the hide or skin past the first processing member to process a first portion of the hide, and the second processing unit comprising a second processing member mounted for rotation in the frame, second roller means arranged in the frame to grip the hide or skin inserted in the machine not later than commencement of processing of the first portion of the hide by the first processing unit, and means for rotating rollers of the second roller means while the hide is gripped by the second roller means to draw the hide or skin past the second processing member to process the remainder of the hide not processed by the first processing unit, said machine also comprising a conveyor device by which the hides or skins are inserted upwardly, from below the first processing unit, into the first processing unit between rollers of the first roller means and between rollers of the second roller means.

4,037,438

LOCKING DEVICE

Peter B. Miller, Fort Lauderdale, Fla., assignor to Milschar Manufacturing & Development, Fort Lauderdale, Fla.

Filed Sept. 8, 1975, Ser. No. 611,076
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—18 **1 Claim**



1. A locking device comprising:
a securing member and a latching means,
said securing member including an intermediate means, a first end means connected to one distal end of said intermediate means, and a connecting means connected to a

portion of said intermediate means for preventing separation from and relative rotational movement in relation to said latching means, and

said latching means including a housing, a rotatable member held in said housing, and a locking mechanism connected in said housing and to said rotatable member,

said housing and rotatable member including first and second mating means for mating with said connecting means to prevent relative separating movement and relative rotational movement,

said connecting means including a first threaded means to prevent relative separating movement and second means to prevent relative rotational movement,

said first mating means including a mating thread for mating with said first threaded means,

a locking mechanism opening means,

said second mating means includes a non-circular portion that is an opening in said housing, and

said second means includes a non-circular portion in mate with said second mating means.

4,037,439

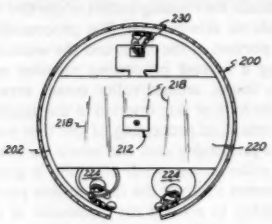
KEY HOLDING APPARATUS

James D. Youd, 113 Metcalf Road, N. Attleboro, Mass. 02760

Continuation-in-part of Ser. No. 584,694, June 6, 1975. This application Mar. 1, 1976, Ser. No. 662,354

Int. Cl.[2] A47G *29/10*

U.S. Cl. 70—456 R **12 Claims**



1. A key case comprising

a. a generally flat circular housing having a top, a bottom and a side wall extending therebetween,

b. a generally flat circular base member disposed within the housing, the base member formed with a plurality of key receiving pockets formed in the base member, and

c. means rotatably mounting the base member relative to the housing, whereby the base member may be grasped and rotated to bring a selected key receiving slot into alignement with the slot.

4,037,440

SECURITY LOCK FOR DOORS

Joseph Shabtai, 41 Geulim St., Holon, and Simon Assaraf, 91 Rothschild St., Rishon Lezion, both of Israel

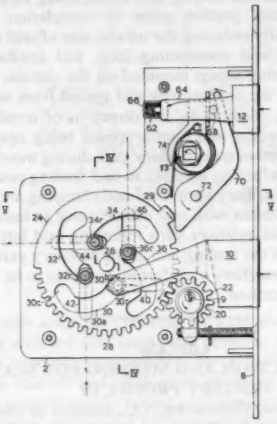
Filed July 7, 1975, Ser. No. 593,554

Claims priority, application Israel, June 25, 1975, 47557

Int. Cl.[2] E05B *59/00*

U.S. Cl. 70—108 **3 Claims**

1. A rim locking device mountable within, and adjacent to, one side of, a door in a door frame, comprising: a casing including a pair of side plates; a cylinder rotatably disposed between the side plates and having a keyhole for receiving a key to rotate the cylinder; a gear carried by the outer surface of said rotatable cylinder; a toothed-wheel rotatably disposed between the side plates and meshing with said gear for rotation thereby upon rotation of the cylinder by the key; and a plurality of locking bars coupled to said toothed-wheel and projectable thereby into locking engagement with the door frame, one of said locking bars being a short locking bar projectable from and withdrawable into said one side of the door, the remaining locking bars being long locking bars projectable from and withdrawable into the remaining three sides of the door, said toothed-wheel being formed with a cam surface for each locking bar, each locking bar carrying at its inner end a cam follower movable along the respective cam surface of the toothed-wheel, at least one of the side plates being formed with a guiding slot for each locking bar guiding the movement thereof such that the rotation of the toothed-wheel in one direction projects the outer ends of the locking bars from the



door into locking engagement with the door frame, and the rotation of the toothed-wheel in the opposite direction withdraws the locking bars into the door; said device further including a tongue projectable from said one side of the door into a recess in the door frame, a spring urging the tongue to its projecting position, a lever pivotable to withdraw the tongue from the door frame, and an abutment carried by said toothed-wheel for pivoting the lever to withdraw the tongue when the toothed-wheel has been rotated in the direction to withdraw the locking bars.

4,037,441

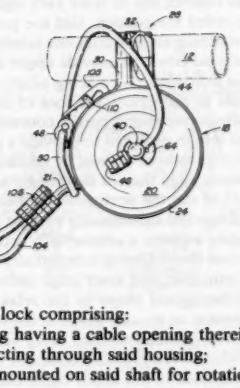
BICYCLE LOCK

Robert D. Ray, 1000 E. 9th, Edmond, Okla. 73034

Filed Mar. 1, 1976, Ser. No. 662,556

Int. Cl.[2] B62H *5/00*

U.S. Cl. 70—233 **15 Claims**



1. A bicycle lock comprising:

a reel housing having a cable opening therein;

a shaft projecting through said housing;

a cable reel mounted on said shaft for rotation in said housing;

spring means connected between said shaft and said cable reel for resiliently opposing rotation of said cable reel in one direction on said shaft;

a guide ring detachably secured to said housing opposite said opening;

a securing cable wound upon said cable reel and projecting through said cable opening and through said guide ring;

a safety cable having one end connected to said housing, a second end secured to said guide ring and connected by said guide ring to the securing cable extended therethrough, and a bight portion between said ends of said safety cable for looping over and engaging a part of the frame of the bicycle; and

a two-part bar clamp secured to the outer side of said housing and including:

a base part having a semicircular opening therein;

an upper cap part having a semicircular opening therein dimensioned to mate with the semicircular opening in said base part; and

means for detachably engaging said base part and said upper cap part with each other and about a portion of a bicycle frame.

4,037,442

CLOAKROOM BRACELET FOR BATHING ESTABLISHMENTS AND THE LIKE

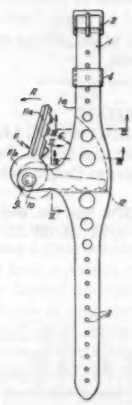
Heinz Staude, and Fritz Goesswald, both of Peiting, Germany, assignors to Eulit Werk Staude & Co. KG, Peiting, Germany

Filed Apr. 29, 1976, Ser. No. 681,701

Claims priority, application Germany, Sept. 4, 1975, 7527905; Jan. 29, 1976, 2603264

Int. Cl.[2] A47G *29/10*

U.S. Cl. 70—456 R **4 Claims**



1. In a cloakroom bracelet for bathing establishments and the like, consisting of a flexible strap made of synthetic resin, which has at one end a buckle and in its middle part a recess for the accommodation of a flat key having a key handle joined on a pivot to the strap, the improvement comprising wherein said recess is designed as a pocket which opens toward one of the narrow faces of the strap, said key handle being pivotal into or out of said pocket about an axis extending at right angles to the plane of said strap and piercing said strap, said strap, on the side where the mouth of said pocket is, having two parallel lugs set at a distance apart and extending substantially at right angles to said narrow face and in the plane of said strap, each of said lugs having near its free end a hole for a pivot axis of said key located between said lugs, said key when in its swung-in position extending substantially at right angles to the lengthwise direction of said strap.

4,037,443

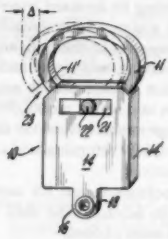
KEY RETAINING DEVICE

Alfred E. Motzer, Meriden, Conn., assignor to The W. E. Bassett Company, Derby, Conn.

Filed Oct. 5, 1976, Ser. No. 729,762

Int. Cl.[2] A47G *29/10*

U.S. Cl. 70—459 **8 Claims**



1. In a key retainer or the like, a case defined by and between spaced edge-connected front and back panel members, with an opening at one end, a slide member having a body movably carried by said case between said panel members, said slide member integrally including a key-receiving generally C-shaped bail including a first end integral with said slide, said first bail end extending in a first direction away from said body and through said opening and beyond said one end of said case, guide means coacting between said slide member and at least one of said panel members and determining a range of slide movement transverse to said first direction and within said case, the other end of said bail being otherwise spaced from said body such that (a) in one limiting position of slide guidance the said other end of said bail coacts with the adjacent region of said case to define an effectively closed key-retaining bail loop and (b) in a second position of slide guidance said other end of said bail is spaced from said case to an extent permitting selective key application to or removal from said bail, and spring means coacting between said slide and case and resiliently urging said slide in the direction of said one position, whereby any force tending to pull an assembled key in said first direction away from said case is totally sustained by said guide means, normally and substantially without risk of slide displacement from said one position.

4,037,444

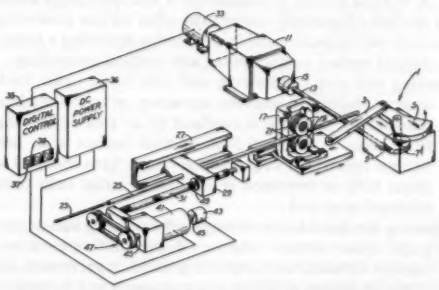
SHELL FEED SYSTEM FOR A COLD PILGER MILL

Harry Calhoon Ledebur, Canfield, and Floyd William Diehl, Jr., Youngstown, both of Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Jan. 10, 1977, Ser. No. 758,384

Int. Cl.[2] B21B *37/00, 17/06*

U.S. Cl. 72—21 **7 Claims**



1. In combination with a cold pilger mill having repetitive

cyclic periods of operation, an improved feed system for feeding a shell into the mill to be reduced thereby, comprising:

feed carriage means,

rotatable feed screw means for advancing said carriage means with a shell,

a power means for rotating said feed screw means to both advance said carriage means from a starting position toward the mill and thereafter to return said carriage means after completing its forward travel.

means for producing a signal representative of the cyclic operational characteristics of the mill, and

control means for receiving said signal and employing it to control the operation of said power means so that said power means drives said screw means during the forward travel of said carriage means to feed the shell into said mill and for thereafter rapidly returning said carriage means to its starting feed position,

said control means includes means for causing said power means to operate to advance the shell at variable preselected lengths or rates of feed.

4,037,445

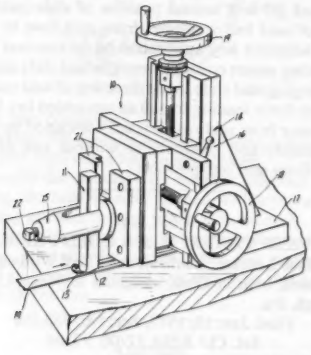
METHOD AND APPARATUS FOR PRODUCTION OF MULTIPLE GAUGE STRIP

Joseph Winter, New Haven; Eugene Shapiro, Hamden, and Warren F. Smith, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 642,594, Dec. 19, 1975, Pat. No. 3,992,977, and Ser. No. 645,749, Dec. 31, 1975, Pat. No. 4,015,459, which is a continuation-in-part of Ser. No. 462,755, April 22, 1974, abandoned, said Ser. No. 642,594, is a continuation-in-part of Ser. No. 462,851, April 22, 1974, abandoned. This application Aug. 30, 1976, Ser. No. 718,850

Int. Cl.[2] B21C *3/10*

U.S. Cl. 72—60 **14 Claims**



1. A method for the production of a multiple gauge metal strip product of generally rectangular cross section possessing regions of two or more variable thicknesses providing a generally stepped surface configuration, said method comprising

shaving said strip by drawing said strip while under back tension through a shaving apparatus whereby surface reduction of the strip is confined to an area comprising from about 5 to about 50% of total surface area, and volume removal of strip material ranges from about 10 to about 60% as measured in relation to initial strip cross sectional area; and

drawing the shaved strip through a die defining said rectangular cross section wherein direct surface-to-surface contact between said strip and said die is prevented, the width dimension of said strip is unchanged and the ratio of strip surface to strip cross sectional area changes by at last 30%.

4,037,446

METHOD OF PRODUCING BRIGHT STEEL FROM ROLLED STEEL WIRE

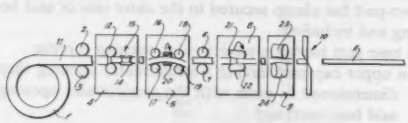
Ralf Fangmeier, Solingen, Germany, assignor to Th.Kieserlin & Albrecht, Solingen, Germany

Filed June 21, 1976, Ser. No. 698,256

Claims priority, application Germany, July 19, 1975, 2532366

Int. Cl.[2] B21B *15/00*

U.S. Cl. 72—68 **6 Claims**



1. A method of converting rolled steel wire into straight bright steel wire, comprising, in combination, the steps of transporting steel wire along a predetermined path through a straightening means; removing peripheral surface portions from the steeel wire entering the straightening means by transporting the steel wire through a peeling means located upstream of the straightening means; reducing the diameter of the steel wire entering the peeling and straightening means by transporting the steel wire through a roller calibrating means located upstream of the peeling means, the roller calibrating means being operative for reducing the diameter of the wire and imparting thereto a round cross-sectional shape in a manner incidentally producing within the thusly calibrated wire persisting internal stresses which tend to result in a loss of roundness of the cross-sectional shape of the steel wire occurring as the latter emerges from the straightening means; and preventing such loss of roundness by plastically deforming the steeel wire to a point beyond its elastic limit using an orbital wire bender located upstream of the peeling means and downstream of the calibrating means.

4,037,447

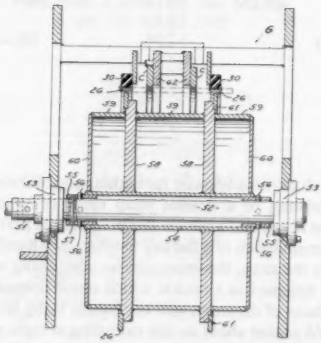
PLANETARY STRAIGHTENING MACHINE

Sheldon E. Sampson, Davisburg, and Don A. Cargill, Bloomfield Hills, both of Mich., assignors to Cargill Detroit Corporation, Clawson, Mich.

Filed Mar. 23, 1976, Ser. No. 669,478

Int. Cl.[2] B21D *3/16, 13/00, 53/00*

U.S. Cl. 72—92 **12 Claims**



1. A planetary production workpiece processing machine comprising;

a stationary frame, a central rigid annular element rotatably mounted on a fixed axis relative to said frame having circumferentially extending workpiece engaging tooling thereon, cooperating non-rotatably fixed non-yieldably rigid reactive workpiece engaging displacement tooling

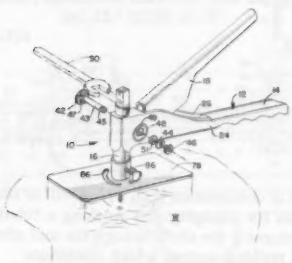
mounted on said frame in non-concentric relation adjacent to the path of said circumferential tooling extending between workpiece entering and exiting positions, said respective rotating and reactive tooling being formed with varying relative spacing accommodating and producing a planetary rolling drive and reaction engagement of the workpiece with varying relative radial displacement to perform a processing operation by stressing said workpiece beyond its elastic limit.

4,037,448

METAL LEVELER TOOL

Anthony E. Di Maio, Georgetown; Alfred E. Bresnahan, Wenham, and Joseph G. Todisco, Georgetown, all of Mass., assignors to Marson Corporation, Chelsea, Mass.

Filed Nov. 25, 1975, Ser. No. 635,065
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—114 **10 Claims**



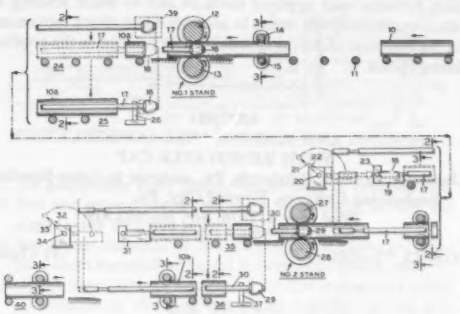
1. Apparatus for use in drawing sheet metal within a dented surface comprising a plate adapted to be received on said sheet metal to span at least a portion of the area of said dented surface, said plate having an opening therethrough, a sleeve mounted on one side of said plate to surround said opening; a metal leveler, said metal leveler including a body having a handle and a housing offset at one end, said housing providing a chamber of substantially cylindrical cross-section between an opening at each end, said housing received in said sleeve with one end opening in longitudinal alignment with said plate opening, a chuck removably received in said chamber and movable longitudinally between two spaced limit positions, a screw having an elongated threaded shank, means for fixedly mounting said screw on said chuck with the threaded shank portion extending longitudinally of said housing through said one end opening, a second handle, means for mounting said second handle on said body for pivotal movement relative to said body handle, means for coupling said second handle and chuck whereupon longitudinal advance of said chuck toward the limit position near said one end opening causes said second handle to pivot in one direction and whereupon pivotal movement of said second handle in the opposite direction causes said chuck to retract longitudinally toward the other limit position nearer the other end opening, and means carried by said chuck for advancing said chuck toward said open end opening so that said screw threadedly engages through said sheet metal in said dent; and means to removably secure said housing in said sleeve.

4,037,449

CONTINUOUS FLOW PLUG MILL SYSTEM

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed July 30, 1976, Ser. No. 710,013
Int. Cl.[2] B21B *17/10*
U.S. Cl. 72—209 **19 Claims**



10. The method of carrying out plug mill operations on a seamless tubular shell, which comprises

a. advancing the shell through a first rolling stage in which the shell is driven through a first mill stand and over a first mandrel supported plug,

b. during said first rolling stage, advancing the shell over a mandrel bar,

c. upon termination of the first rolling stage, transferring the shell and the mandrel bar contained within it laterally,

d. thereafter advancing the shell through a second rolling stage, in which the shell is driven through a second mill stand and over a second mandrel supported plug, and

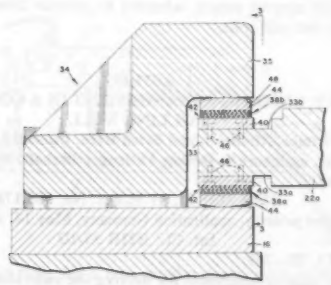
e. stripping the shell from said mandrel bar during the second rolling stage.

4,037,450

APPARATUS FOR SUPPORTING BEARING CHOCKS IN A ROLLING MILL

Martin Gilvar, Oakham, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 632,685, Nov. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 562,636, March 27, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,392
Int. Cl.[2] B21B *31/02, 31/24*
U.S. Cl. 72—237 **4 Claims**



1. In a rolling mill, the combination comprising: a housing; a work roll journalled for rotation between bearing chocks contained in said housing; first restraining means acting on said chocks to oppose forces exerted axially on said roll during mill operation; second restraining means acting on said chocks to oppose roll separating forces exerted transversally on said roll during mill operation, said housing and said first and second

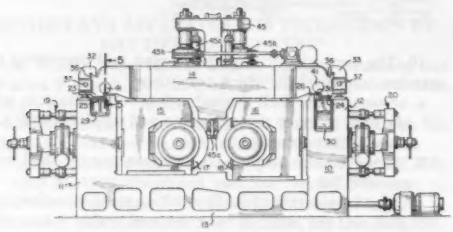
restraining means being suitably dimensioned to accommodate movement of said chocks in the direction of rolling during mill operation; bearing pads positioned between opposed surfaces of said bearing chocks and said first restraining means, each of said bearing pads having integrally joined alternating layers of metal and an elastomer lying in planes perpendicular to the chock axes, the said layers being subjected both to compression between said opposed surfaces and to shear tending to distort said elastomer layers to accommodate chock movement in the direction of rolling as tension is developed in the product being rolled.

4,037,451

PIERCING AND REELING MILL CONSTRUCTION WITH REMOVABLE CAP

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed May 4, 1976, Ser. No. 682,919
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—238 **11 Claims**



1. A top opening mill for rolling tubular workpieces, which comprises

a. a lower mill frame structure comprising a base and spaced sets of frame uprights on opposite sides of the mill pass line,

b. a mill cap extending over the pass line and adapted to connect the top of said sets of frame uprights to form a closed mill frame structure for the containment of removable mill roll modules,

c. a retractable mill shoe support carried by said cap,

d. means for releasably clamping said mill cap to said mill frame uprights,

e. generally horizontal guiding and support means for guiding and supporting said mill cap for longitudinal movement relative to the mill uprights in the direction of said pass line, and

f. means for controllably moving the unclamped mill cap on said support means, whereby to provide overhead access to the mill rolls.

4,037,452

GROUP GEARING ARRANGEMENT IN A CONTINUOUS ROLLING MILL

Karl Grimpe, Mulheim, and Erich Reth, Duisburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed May 11, 1976, Ser. No. 685,175
Claims priority, application Germany, May 14, 1975, 2521393
Int. Cl.[2] B21B *35/02*
U.S. Cl. 72—249 **4 Claims**

1. A gear arrangement for driving the individual stands of a continuous rolling mill, particularly for a wire manufacturing block comprising

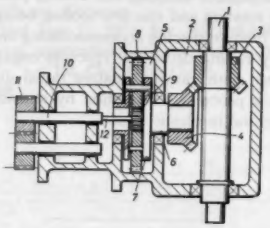
a. a motor;

b. a common main drive shaft driven by said motor;

c. a secondary speed drive shaft for each stand;

d. a bevel gear arrangement disposed between said main drive shaft and each said secondary speed drive shaft; characterized by

e. a planetary gear connecting said bevel gear arrangement to each said secondary speed drive shaft, and



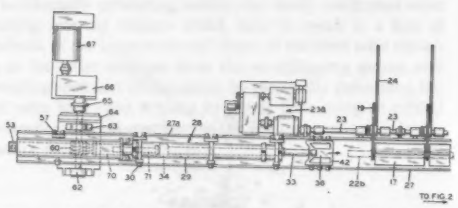
f. the sun gear of said planetary gear is fixed on one end of said secondary speed drive shaft outside the bearings therefor.

4,037,453

SHELL PUSHER FOR PLUG MILL OR THE LIKE

Robert A. Remner, Sewickley, and Leroy V. Rowland, Evans City, both of Pa., assignors to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed May 4, 1976, Ser. No. 682,917
Int. Cl.[2] B21B *39/06*
U.S. Cl. 72—252 **16 Claims**



6. For use in combination with a plug mill or the like having working rolls for engaging and working a tubular shell and means for returning the shell through the mill after a working pass, a shell pushing system, which comprises

a. a pusher cylinder and ram having a ram stroke of sufficient capacity to push an unworked shell from a predetermined load position into working engagement with the mill but of insufficient stroke capacity to push an unworked maximum length shell into working engagement with the mill from an initial ram position which is spaced far enough from the mill to accommodate the shell after elongation in the mill,

b. means supporting said pusher cylinder for movement toward and away from the mill, and

c. controllable drive means for advancing and retracting said pusher cylinder.

4,037,454

TUBE FORMING

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

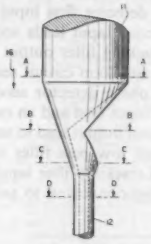
Filed June 10, 1976, Ser. No. 694,499
Int. Cl.[2] B21C *25/02*
U.S. Cl. 72—264 **16 Claims**

1. A method of forming a metallic tube from an unpierced metallic billet, which method comprises the steps of:

a. extruding the billet along a longitudinal direction through a first die aperture region so configured as to provide the billet with a generally C-shaped cross-section perpendicular to said longitudinal direction; then

b. further extruding the billet through a second die aperture region so configured as to reduce the diameter of the generally C-shaped cross-section; while simultaneously

c. guiding both ends of the generally C-shaped cross-section continuously toward and then into contact with one another within said second die aperture region so as to form a tubular shape; and then



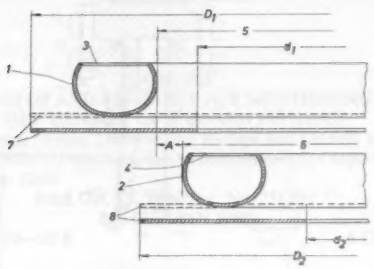
d. welding said contacting ends together so as to form said metallic tube.

4,037,455

PROCESS FOR PRODUCING METAL RINGS

Max Ruf, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Germany

Filed June 22, 1976, Ser. No. 698,744
Claims priority, application Germany, June 28, 1975, 2528905
Int. Cl.[2] B21D *43/28*
U.S. Cl. 72—324 1 Claim



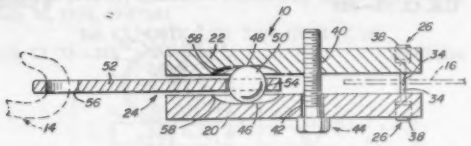
1. A process for production of two metal rings having a concave C-shaped cross-section, each open in axial direction, in particular for annular sealing members, the outside diameter of the one ring being slightly smaller than the inside diameter of the other ring, comprising the steps of providing an annular strip the outside diameter of which is larger than the outside diameter of a strip as required for the larger ring if produced singly and after the annular strip has subsequently been deep-drawn, will correspond to the outside diameter of a strip as required for the larger ring if produced singly and the inside diameter of which is equal to the inside diameter of a strip as required for the smaller ring if produced singly, preliminarily shaping the annular strip by deep-drawing the strip to initially form more or less parallel planar zones off-set step-wise in cross-section and connected by way of roundings by an intermediate web extending obliquely outward between the parallel zones, so that the web together with its adjacent zones already acquires the initial form of the neighboring branches of the C-shaped cross-sections of the rings, parting intermediate the roundings to form individual annular strip parts and finally shaping by deep-drawing the individual strip parts thus preformed into finished rings having their final C-shaped cross-section.

4,037,456

AUTO BODY CLAMP

Davis R. Jarman, Brunswick, Ga., assignor to Virgil Hinson, Brunswick, Ga., a part interest

Filed July 15, 1976, Ser. No. 705,564
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—325 3 Claims



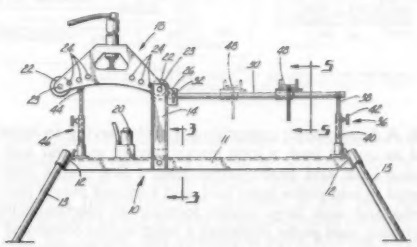
1. An automobile body clamp, comprising, in combination:
a. first and second plates attachable to a pulling device, the plates being disposed in an adjacent relation;
b. jaw means mounted on at least one of the plates for gripping sheet material arranged between the plates; and
c. clamp means arranged engaging the first and second plates for selectively drawing the plates together at the jaw means, the clamp means including each of the plates being provided with a through hole mating with the hole provided in the other of the plates, and an adjustable fastener arranged in the holes for selectively drawing the plates toward one another, and the clamp means further including fulcrum and attachment means for permitting attachment of the plates to a pulling device while simultaneously forming a fulcrum about which the plates pivot under the influence of the adjustable fastener, with the attachment means including each of the plates being provided with a recess disposed opposite the recess provided in the other of the plates, the holes provided in the plates being arranged between the teeth and the recesses, a ball movably arranged in the recesses, and a tongue connectible to a pulling device and provided with a through opening, the ball being disposed in the opening and mounting the tongue for swivel movement, the recesses being provided with opposed inclines which function as cam surfaces causing the plates to widen at the associated end thereof when a pull on the tongue causes the ball to roll up the inclines.

4,037,457

SUPPORT TABLE FOR PIPE BENDER

John E. Henderson, 8404 Locust Drive, Kirtland, Ohio 44094

Filed Sept. 17, 1975, Ser. No. 614,324
Int. Cl.[2] B21D *7/04*
U.S. Cl. 72—389 8 Claims



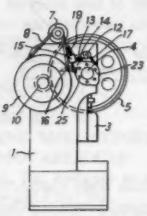
1. A support table for a pipe bender comprising, a pair of upright support members, said upright support members including means to pivotally mount one end of a pipe bender therebetween, first and second support means on opposite sides of said pivotal mounting means, and means to vertically adjust both said first and second pipe support means to a plurality of horizontal positions; whereby various size pipes can be supported within the bender in a level configuration irrespective of the shoe size and position of the bender.

4,037,458

SILENCING METHOD AND SILENCER DEVICE IN CRANK PRESS MACHINE

Fumio Sato, 2855-1, Nishifuzi cho, Onomichi, Hiroshima, Japan

Filed Feb. 26, 1976, Ser. No. 661,683
Claims priority, application Japan, Mar. 4, 1975, 50-26886
Int. Cl.[2] B21J 9/20
U.S. Cl. 72—429 **6 Claims**



1. In a crank-driven press having a machine frame, a crankshaft rotatable in said frame, a press tool coupled to the crank of said crankshaft and driven thereby in a pressing stroke, the improvement which comprises:

i. brake means on said machine frame to act on said crankshaft, and

ii. cam means driven in synchronism with said crankshaft and coacting with said brake means so as to cause said brake means to brake said crankshaft during a period commencing shortly before and terminating shortly after said press tool terminates its pressing stroke,

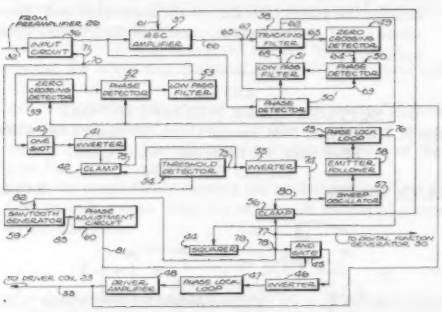
thereby to reduce vibration and noise of operating said press.

4,037,459

DENSITOMETER

Gerald L. Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 28, 1976, Ser. No. 700,401
Int. Cl.[2] G01N 9/00
U.S. Cl. 73—32 A **2 Claims**



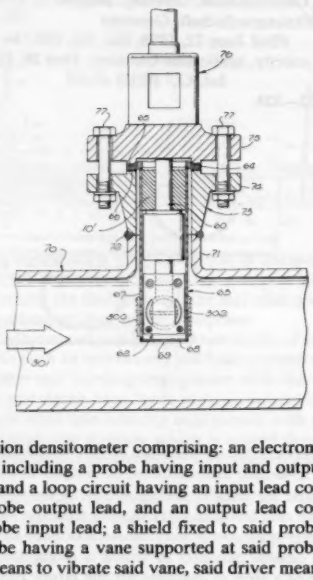
1. A densitometer comprising: a probe having an input lead and an output lead; a loop circuit having an input lead connected from said probe output lead, a first output lead connected to said probe input lead, and a second output lead, said probe and said loop circuit forming an electromechanical oscillator, said probe including a vane, means connected from said probe input lead to vibrate said vane, a transducer, means connecting said transducer to said probe output lead to produce a first A.C. signal thereon of the same frequency as that at which said vane vibrates, said first A.C. signal having a frequency which is a known invariant function of the density of the fluid in which said vane is immersed, a second A.C. signal being impressed upon said loop circuit second output lead of the same frequency as that of said first A.C. signal; utilization means; output means connecting said loop circuit second output lead to said utilization means; a phase detector for adjusting the phase of said second signal so that it remains the same relative to said first signal independent of changes in said probe, said loop circuit or said fluid, said phase detector having first and second input leads and an output lead, said loop circuit including an input circuit having an input lead connected from said probe output lead, and an output lead connected to said phase detector first input lead, a tracking filter having first and second input leads and an output lead, means connecting said tracking filter output lead to said loop circuit first output lead, said loop circuit second output lead being connected to said phase detector second input lead, a low pass filter having an input lead and an output lead, means connecting said input circuit output lead to said first input lead of said tracking filter, said low pass filter output lead being connected to said second tracking filter input lead, said phase detector output lead being connected to said low pass filter input lead.

4,037,460

DENSITOMETER

Milton H. November, Hacienda Heights, and LaVerne D. Lyon, Claremont, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 29, 1976, Ser. No. 709,582
Int. Cl.[2] G01N 9/00
U.S. Cl. 73—32 A **8 Claims**



1. A vibration densitometer comprising: an electromechanical oscillator including a probe having input and output leads, a lower end, and a loop circuit having an input lead connected from said probe output lead, and an output lead connected from said probe input lead; a shield fixed to said probe lower end, said probe having a vane supported at said probe lower end; driver means to vibrate said vane, said driver means being located above said vane, an upper mounting; an extension fixed to said upper mounting and attached to said driver means, said shield defining an annular recess; and a perforate annular body positioned around said shield in said recess thereof.

4,037,461

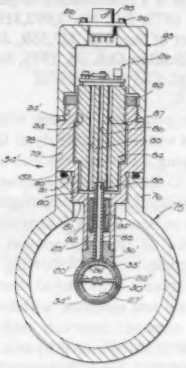
PROBE AND METHOD OF MAKING THE SAME

Charles Eveleigh Miller, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,739
Int. Cl.[2] G01N 9/00
U.S. Cl. 73—32 A **3 Claims**

1. A vibration densitometer probe, said probe comprising: a substantially fixed structure; a vane; and means to support said vane on said fixed structure, said vane having a symmetrical embossment on each side thereof, said fixed structure including

a hollow cylinder having a symmetrical axis, said vane being generally rectangular in plan view defined between a pair of longitudinal edges fixed relative to and inside said cylinder,



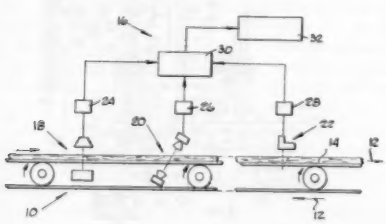
said vane having a symmetrical axis coincident with said cylinder axis, said embossments being symmetrically fixed relative to said vane on opposite sides of said vane and said coincident cylinder and vane axes.

4,037,462

METHOD OF AND ASSEMBLY FOR MONITORING THE DRY DENSITY OF A BOARD PRODUCT

Carl George Necker, Littleton, and Richard Rial Colwell, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 12, 1976, Ser. No. 731,381
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 R **6 Claims**



1. A method of monitoring the dry density of a board product made by a wet forming process, which process includes preparing an aqueous slurry of at least some of the compenents making up the product, depositing said slurry on a moving screen to form a moisture-laden sheet thereon, and removing said moisture from said sheet to form said product, said method comprising:

a. simultaneously and automatically measuring the wet weight, moisture content and thickness of said water-laden sheet while said sheet is on said moving screen; and

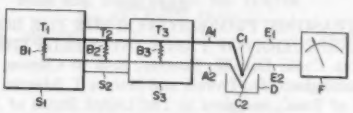
b. from these measurements automatically calculating the dry density of the board product to be produced from the measured sheet.

4,037,463

TEMPERATURE-DETECTING ELEMENT

Yoshiaki Arakawa; Isamu Aoyanagi, and Saburo Matsumoto, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,070
Claims priority, application Japan, July 10, 1974, 49-78968; July 30, 1974, 49-87142
Int. Cl.² G01K *3/06, 7/04;* G08B *17/00*
U.S. Cl. 73—341 **20 Claims**



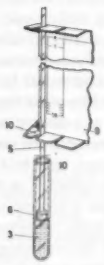
1. An element for detecting a weighted mean temperature of a given region comprising two metal wires constituting a thermocouple, and electric resistor means consisting of a plurality of heat-insensitive resistors each electrically connected between said two metal wires and each within a different defined section in said region, each resistor having a temperature coefficient of less than 300 ppm/° C absolute, wherein the resistance of said resistor means is at least 30 times the sum of resistance of said two metal wires, and the resistance ratio between any two resistors is the reciprocal of the ratio between the areas of the two sections within which the said two resistors are respectively disposed.

4,037,464

DEVICE FOR TRANSFERRING BLOOD OR A SIMILAR FLUID TO A PIPETTE

Björn Wenander, Saro, Sweden, assignor to Mediplast AB, Molndal, Sweden

Filed June 5, 1975, Ser. No. 584,163
Claims priority, application Sweden, June 24, 1974, 7408222
Int. Cl.² G01N *1/14, 33/16*
U.S. Cl. 73—61.4 **4 Claims**



1. An improved expendable assembly for transfer of blood, comprising a test tube and a pipette for determination of the sedimentation rate of a blood sample, said pipette including a compressible, transparent tube provided at one end with a cylindrical body having an axial through-channel communicating with the pipette, said cylindrical body forming a piston slidingly accommodated in the test tube so that blood is caused to rise in the to a predetermined level by displacing the piston downward into the test tube, and a stand provided with at least two upper and lower vertically spaced series of locking tongues arranged, after the pipette is filled, to secure the pipette in a vertical position by pinching said compressible pipette tube between two adjacent tongues in each one of said spaced-apart series of locking tongues, thereby pinching the pipette tube so as to give the pipette said sample of blood isolated from the interior of the test tube so that determination

of the sedimentation rate of the blood sample can be accomplished.

4,037,465

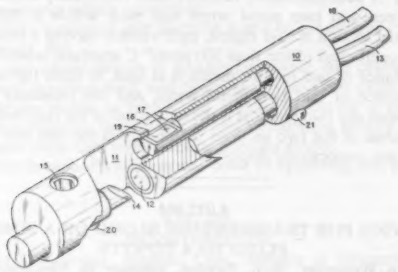
ULTRASONIC PROBE SYSTEM FOR THE BORE-SIDE INSPECTION OF TUBES AND WELDS THEREIN

K. Von Cook; Dan W. Koerner, both of Clinton; Robert A. Cunningham, Jr., Powell, and Horace T. Murrin, Jr., Alcoa, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,371

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—67.8 S 8 Claims



1. An ultrasonic probe system for the bore-side inpsection of small tubes and welds therein comprising a two-channel probe adapted to be rotated at a selected speed within a tube to be inspected and to be moved axially along said tube a selected amount for each revolution of said probe, said probe including a cylindrical body member, a first transmitter-receiver ultrasonic transducer mounted within said body member, a deep recess provided in the forward end of said body member, said first transducer facing axially and forwardly into said recess, a reflector mounted within said recess and aligned with said first transducer for receiving ultrasound therefrom and directing it into the wall of said tube at a desired angle, said reflector also receiving ultrasound reflected from said tube and directing it back to said first transducer, said body member further provided with a small notch oriented at 90° and rearward from with respect to said recess, a second ultrasnic receiver transducer mounted in said body memberwith the face thereof projecting into said notch for receiving ultrasonic signals from the inside wall of said tube, a ridge positioned between said recess and said notch which serves as a baffle between said respective transducers, said body member further provided with a separated pair of spring loaded biasing means for maintaining said ridge baffle against the inside wall of a tube being inspected, said system further including a first ultrasonic signal generator and receiver unit, an ultrasonic signal receiver unit, rotary joint means for coupling said respective units to said respective first and second transducers, recorder means, a longitudinal potentiometer actuated by axial movement of said probe, a rotation potentiometer actuated by rotary movement of said probe, said respective potentiometers providing respective X and Y inputs to said recorder means, and means for amplifying the received ultrasound outputs of said ultrasound units feeding them to said recorder means, whereby any flaws and/or defects on the outer and inner surfaces of said tube to be inspected are recorded by said recorder means.

4,037,466

METHOD OF REGENERATING A GLYCOL-ETHER TYPE INSPECTION PENETRANT REMOVER BY SOLVENT EXTRACTION

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 606,285, Aug. 20, 1975, Pat. No. 3,988,924, which is a continuation-in-part of Ser. No. 577,323, May 14, 1975, Pat. No. 3,992,319, which is a continuation-in-part of Ser. No. 327,559, Jan. 29, 1973, abandoned. This application Oct. 26, 1976, Ser. No. 735,681

Int. Cl.[2] G01N *19/02*

U.S. Cl. 73—104 8 Claims

1. In an inspection penetrant process which includes the steps of (1) applying a water-insoluble dyed liquid pentrant to test surfaces, (2) applying a solvent remover to said penetrant-treated test surfaces to dissolve and remove excess surface penetrant, leaving entrapments of penetrant in any surface cracks which may be present, and (3) inspecting said test surfaces for the presence of flaw-entrapment indications, the improvement which comprises the following step

a. After using said solvent remover to dissolve dyed liquid penetrant from said test surfaces, withdraw the said used remover from a remover reservoir tank and circulate it through a column of halogenated hydrocarbon extraction solvent, returning said used remover to said remover reservoir tank, said solvent remover comprising a mixture in water of a glycol-ether solvent liquid which is substantially inert to extraction from water solution, said glycol-ether liquid being present in the water mixture at dilution ratios from about 2 – 1 up to about 300 – 1 by halogenated hydrocarbon extraction solvent.

4,037,467

FUEL INJECTOR TESTING APPARATUS

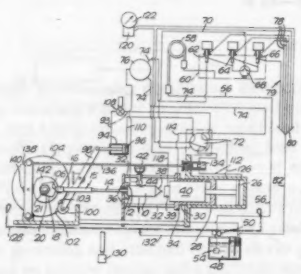
Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Oct. 15, 1976, Ser. No. 732,707

Claims priority, application United Kingdom, Oct. 17, 1975, 42668/75

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—119 A 12 Claims



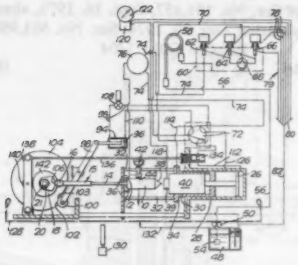
1. Apparatus for testing fuel injectors having their own in-built high pressure pump, the said apparatus comprising: removable motion-transmitting means adapted to engage and actuate the high pressure pump of an injector to be tested on the apparatus, driving means comprising a cam-shaft and a motor driving said cam-shaft for imparting motion to said motion-transmitting means, a fuel-collecting nose assembly to receive the nozzle end of an injector to be tested, and an hydraulic clamp for engaging and thus clamping the nozzle end of the injector into the said fuel-collecting nose assembly, the said motion-transmitting means serving also as a positioning means for positioning an injector when the latter is fitted on the apparatus for testing.

4,037,468

FUEL INJECTOR TESTING APPARATUS

Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Oct. 15, 1976, Ser. No. 732,779
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A 7 Claims



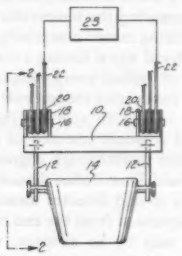
1. Apparatus for testing fuel injectors having their own in-built high pressure pump, the apparatus comprising means for axially locating and clamping an injector to be tested on the apparatus, a fuel arm assembly for supplying fuel to an inlet on the injector, and means for mounting the said fuel arm assembly for swinging movement into and out of a fuel-supplying position, the said fuel arm assembly including a valve adapted to make sealing contact with the injector outlet and a spring for urging the said valve into a closed position, the valve being pushed into its fuel-supplying position, against the action of the said spring, when the valve makes sealing contact with the injector inlet.

4,037,469

FORCE MEASURING APPARATUS

Kjell Helge Nordstrom, and Rune Nils Allan Flinth, both of Vasteras, Sweden, assignors to Transrail AB, Vasteras, Sweden

Filed Aug. 11, 1975, Ser. No. 603,595
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—141 A 16 Claims



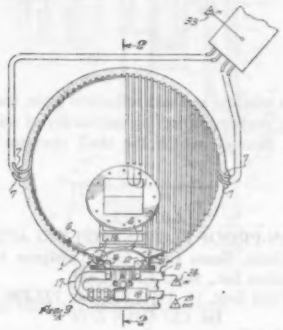
13. In a material handling apparatus, an elongated force-transmitting member having a substantially horizontal axis, a pair of longitudinally extending elongated beam members having central portions engaging spaced portions of said elongated force transmitting member, said elongated beam members deflecting longitudinally in response to forces applied to the end portions of said beam members and to the portion of the force transmitting member engaging the central portions of said elongated beam members and directed in a force measuring direction normal to the longitudinal axes of the elongated beam members, said elongated beam members engaging said force transmitting member in a manner which permits movement of said beam members relative to said force transmitting member transverse to said force meassuring direction, and means for measuring the strain introduced into said beam members due to the application of said forces applied thereto.

4,037,470

METHOD AND APPARATUS FOR MEASURING HIGH ENERGY LASER BEAM POWER

Kenneth John Mock, Inglewood, and Joseph Daniel Mozic, Playa Del Rey, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 715,776
Int. Cl.[2] G01K *17/00*
U.S. Cl. 73—190 EW 16 Claims



1. A method of instantaneously determining the power of high energy laser beams comprising:

directing the full laser beam intensity onto a thin-walled partially-reflective heat-conducting tubular substrate formed of a plurality of adjacently-disposed tube-like members,

absorbing by heat-exchange a predetermined minor fraction of the full intensity in a coolant medium carried by (said tubular substrate) each of said tube-like members and reflecting the balance,

said predetermined fraction being determined in accordance with the heat input needed to produce a temperature rise in said tubular coolant that is as instantaneous as possible within temperature limits consistent with maintaining the physical integrity of the substrate, and

measuring said temperature rise for determining the full intensity laser beam power.

4,037,471

OIL LEVEL DETECTION DEVICE IN ENGINE OIL PAN

Yoshinori Okamoto, Kawagoe, and Toshio Tsuruoka, Kitaooizumi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed May 28, 1976, Ser. No. 691,192
Claims priority, application Japan, June 6, 1975, 50-76452[U]
Int. Cl.[2] G01F *23/02*
U.S. Cl. 73—324 6 Claims

1. An oil level detection device which comprises, in combination:

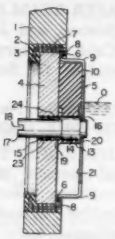
a. a receptacle for accommodating therein engine lubricating oil;

b. a window opening formed in one part of the side wall of said oil receptacle, a packing being fitted around the peripheral edge of said window opening to enable a window glass to be fitted therein to constitute an oil level detection window;

c. a reflection plate provided within said oil containing vessel in confrontation to the inner surface of said oil level detection window glass, and securely fitted at the peripheral edge thereof to said packing;

d. wiper means interposed between the inner surface of said window glass and said reflection plate; and

e. a rotational shaft for supporting a base portion of said wiper means, said shaft being supported on said oil level



detection window and said reflection plate, and having an operating portion projecting outwardly of said detection window, through which the shaft operates said wiper means.

4,037,472

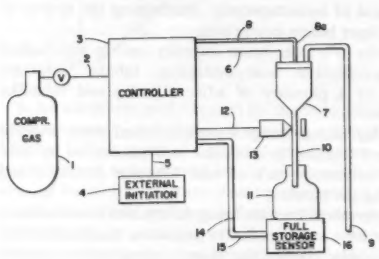
EXPLOSION-PROOF FLOW SAMPLING APPARATUS

Wendall C. Gates, Santa Cruz, Calif., assignor to Advanced Instrumentation Inc., Santa Cruz, Calif.

Filed Sept. 16, 1976, Ser. No. 723,820

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—421 B **21 Claims**



1. An explosion-proof flow sampling apparatus for taking samples from liquids which may contain solids, comprising:

a sealed chamber;

an intake conduit connecting the chamber with the flow to be sampled;

a source of vacuum connected to the chamber;

a drain conduit at the bottom of the chamber for draining a sample into a storage container below, said drain conduit including a shutoff valve;

a tube leading downward from the top of the chamber to a level approximately representing a full chamber, said source of vacuum communicating with the chamber through the tube;

means for sensing a predetermined pressure difference between the interior of the tube and the remainder of the chamber above the level of the liquid; and

pneumatically-operated controller means operably connected to said sources of pressure and vacuum, to said drain conduit shutoff valve, and to said sensing means, including means for activating the source of vacuum to exert suction on the chamber while holding closed the shutoff valve to draw sample material into the chamber through the intake conduit until the sensing means senses said predetermined pressure difference; means for terminating the vacuum after the sensing of said pressure difference; and means for subsequently opening the shutoff valve to drain the sample through the drain conduit to the storage container.

4,037,473

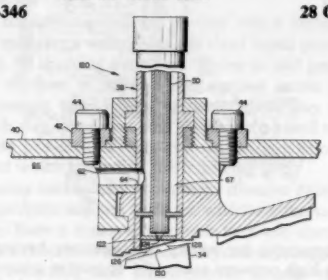
RADIATION PYROMETERS WITH PURGING FLUID

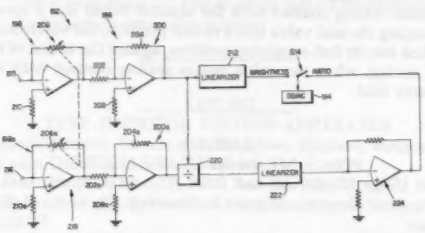
William A. Compton; Thomas E. Duffy, and Manfred I. Seegall, all of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.

Continuation of Ser. No. 181,157, Sept. 16, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,988

Int. Cl.[2] G01J *5/04*

U.S. Cl. 73—346 **28 Claims**





28. The combination of a turbine engine comprising an apertured housing and a wheel rotatably mounted in said housing with means for measuring the temperature of said wheel, said temperature measuring means comprising detector means for generating an electrical signal having a magnitude proportional to the intensity of radiant energy impinging thereon; a fiber optics device for conducting radiant energy to said detector means; a member having an aperture therethrough, said member being located adjacent one end of said fiber optics device with the aperture therethrough aligned with the aperture in said housing, said fiber optics device extending from said apertured member to said detector means, and said apertured member being separated from the end of the fiber optics device thereadjacent only by an airspace, whereby radiant energy emitted from said wheel can pass seriatim through the apertures in said housing and in said apertured member and be directed by said member onto the end of the fiber optics device and thence conducted to the detector means.

4,037,474

REPRESENTATIVE SAMPLING DEVICE

Walter Robert Kost, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

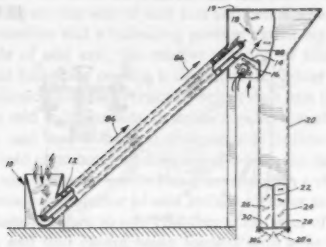
Filed Feb. 6, 1976, Ser. No. 655,924

Int. Cl.[2] G01N *1/02*

U.S. Cl. 73—421 R **10 Claims**

1. An apparatus for separating out a representative sample from a collection of various pieces of paper comprising a chamber having an upper and a lower portion, means for

conveying the pieces of paper in an even flow into said chamber, means for generating a stream of air to blow through and gently toss the pieces of paper as they enter into said chamber, an elongated tube means adjacent the lower portion of said chamber through which the pieces of paper can free fall due to gravity after said pieces leave the said chamber, the sides of said tube being free of substantial inward convergence from its



end adjacent the lower portion of said chamber to the lower portion of said tube to prevent the sliding of the pieces of paper down the sides of said tube which sliding would provide a separating out of such pieces different in make-up from that provided by the free fall of said pieces, and means associated with the lower portion of said elongated tube to divide the pieces of paper into desired proportions.

4,037,475

SAMPLING DEVICE

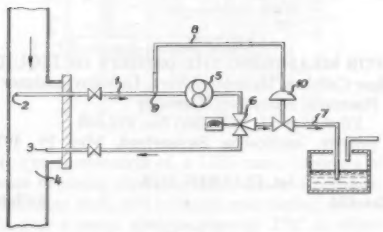
William Henry Topham, Rochester, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 23, 1976, Ser. No. 669,637

Claims priority, application United Kingdom, Apr. 18, 1975, 16067/75

Int. Cl.² G01N *1/14*

U.S. Cl. 73—422 R **5 Claims**



1. A liquid sampling device comprising a liquid conduit loop including a pair of ends adapted to be in open communication with a liquid source, a pump connected in said loop intermediate said ends for circulating liquid at a substantially constant rate from one of said ends to the other thereof and a sample outlet valve connected in said loop downstream from said pump for removing a sample of liquid from said loop, said valve having an outlet through which said sample flows, and a back-pressure valve connected between said outlet and said loop upstream of said pump, said back-pressure valve being responsive to the liquid pressures at said outlet and in said loop upstream of said pump and maintaining any difference between the pressure at said outlet and the pressure at said loop upstream of said pump substantially constant.

4,037,476

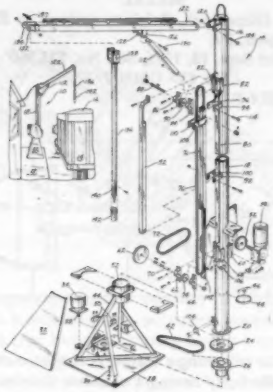
GRAIN SAMPLING PROBE

James McCrabb, R.R. 2, West Liberty, Muscatine County, Iowa 52776

Filed June 21, 1976, Ser. No. 697,737

Int. Cl.² G01N *1/08*

U.S. Cl. 73—423 R **22 Claims**



1. A grain sampling probe comprising,

a base,

an elongated support pole, mounted to said base,

a support arm having inner and outer ends, said inner end being pivotally connected to said support pole,

a vertically disposed elongated hollow probe pivotally connected to said outer end of said support arm,

a first power output means, and

mechanical drive means associated with said power output means, said support arm and said support pole to move said probe at a uniform rate of speed downwardly and upwardly.

4,037,477

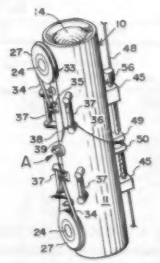
WATER SAMPLER DEVICE

Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133

Filed June 1, 1976, Ser. No. 691,905

Int. Cl.² G01N *1/10*

U.S. Cl. 73—425.4 R **11 Claims**



1. A water sampler device for collecting a sample of water at a desired depth in a body of water comprising a substantially elongated tubular member, valve seat means mounted at each end of said tubular member, substantially spherical valve means mounted on each of said valve seat means in an initially closed position to prevent contaminated surface waters of said body of water from entering into said tubular members, valve rotating means connected to each of said valve means, valve operating means connected to said valve rotating means for consecutively rotating each of said valve means from said closed position to an open position to permit the flow of fluid

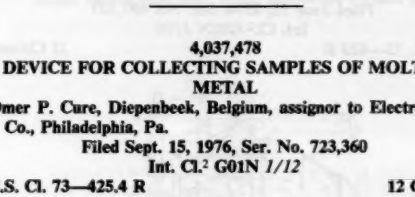
through said tubular member when said device has arrived at said depth in said body of water and then to a further closed position to contain water in said tubular member.

4,037,478

DEVICE FOR COLLECTING SAMPLES OF MOLTEN METAL

Omer P. Cure, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Sept. 15, 1976, Ser. No. 723,360
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R 12 Claims



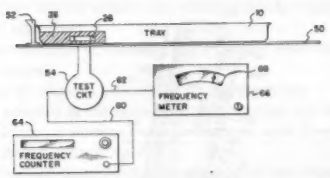
1. A device for collecting a sample of molten metal comprising a non-metallic body having a chamber therein, a vessel in said chamber, a filling conduit supported by said body, said conduit having one end communicating with said vessel, a tube of deoxidizing material supported by said body adjacent the other end of said conduit and communicating therewith, and a metal ring coupled to the outer diameter of said tube, said metal ring having a melting temperature greater than the melting temperature of said tube.

4,037,479

METHOD AND APPARATUS FOR SENSOR ASSEMBLY INSPECTION

William H. Kuntz, Louisville, Ky., and Donald G. Moore, Glencoe, Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Dec. 1, 1975, Ser. No. 636,804
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—432 R 8 Claims



1. Apparatus for testing a traysensor arrangement which is suitable for use in a microwave oven to determine whether a ferromagnetic sensor has been properly positioned and assembled on the tray, the testing apparatus comprising:

frequency determinative circuit means for generating an electrical signal,

means for positioning a tray in predetermined relation to said frequency determinative circuit means so that the frequency of said electrical signal is determined by the relative position of said ferromagnetic sensor on said tray, and

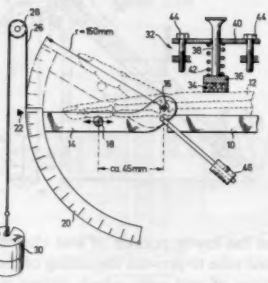
frequency comparison meas, coupled to said frequency determinative circuit means, distinguishing among properly and improperly assembled trays, and trays assembled for alternative applications based upon frequency.

4,037,480

MANUAL DEXTERITY APTITUDE TESTING

Christoph Wagner, Dortmund-Kirchhorde, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v., Gottingen, Germany

Continuation of Ser. No. 403,956, Oct. 5, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,725
Claims priority, application Germany, Oct. 7, 1972, 2249208
Int. Cl.[2] A61B *5/00*
U.S. Cl. 73—432 R 17 Claims



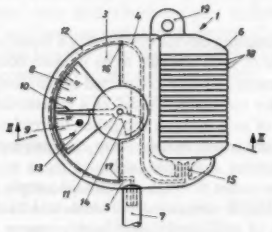
1. An apparatus for testing a joint system between two relatively movable parts of the arm system of a person in order to determine said person's aptitude for activity requiring manual dexterity, said apparatus comprising first means for supporting one of the two relatively movable parts, second means for supporting the other of the two parts, at least one of the first and second means being capable of rotation about an axis which substantially coincides with an axis of one degree of freedom of rotational movement of the joint system when the two connected parts are supported in the first and second means, each of the first and second means including means for preventing movement of the respective supported part relative to the first or second means in a direction of decreasing stress on the joint system, third means for applying a constant predetermined force to at least one of the first and second means for biassing the latter to rotate in a direction of increasing stress on the joint system, and fourth means for measuring the static deflection of the joint system resulting from the application of the constant force, the measurement being indicative of the person's aptitude for the given activity.

4,037,481

DEVICE FOR MEASURING THE DENSITY OF LIQUIDS

George Edgar Callahan, Dusseldorf-Nord, Germany, assignor to Helmut Naumann, Dusseldorf, Germany

Filed May 12, 1975, Ser. No. 576,646
Claims priority, application Switzerland, May 21, 1974, 6972/74
Int. Cl.[2] G01N *9/16*
U.S. Cl. 73—454 8 Claims



1. A portable device for measuring the density of liquids, comprising a casing having a chamber formed therein, a float-

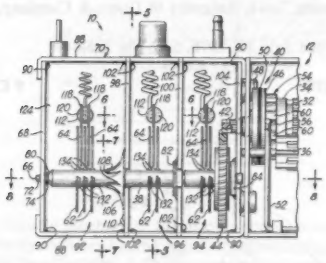
ing element pivotally mounted in said chamber to turn about an axis which is arranged to be horizontal when said device is being used to measure the density of a liquid, said floating element being formed as a scale member, a reference element pivotally mounted about said axis and exterior to said chamber, said reference element adapted to remain stable in equilibrium about said axis during said use, said reference element being formed as an indicator arm which comprises a proper arm extending on one side of said axis and being movable over the scale member and a balancing portion extending to the opposite side of said axis, the relative position of said proper arm and said balancing portion is such that the center of gravity of the indicator arm lies vertically below said axis thereby maintaining said indicator arm in stable equilibrium about said axis during said use, a resilient compressible hollow element for filling said chamber with a liquid of which the density is measured, said hollow element being formed with a channel means connecting the interior of said hollow element at the outlet of said channel means to said chamber at the inlet of said channel means, and said casing being formed with a further channel through which said chamber can be filled with said liquid, said hollow element being of such size that said chamber can be filled through said further channel by compression and release of said hollow element.

4,037,482

ACCURATE UHF TELEVISION TUNING SYSTEM AND METHOD OF FABRICATING SAME

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 13, 1975, Ser. No. 577,062
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.41 **18 Claims**



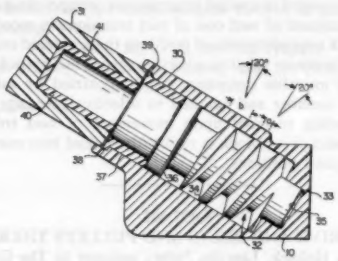
1. The combination of, a UHF tuner having a plurality of groups of tuning elements connected to a common rotatable main tuning shaft, said rotatable main tuning shaft being rotatable over a range of approximately 270° to effect selective reception of all television stations in the UHF television band, a control shaft, gear means interconnecting said control shaft and said main tuning shaft, detent means for said control shaft to establish a stop position of said main tuning shaft for each of the seventy television stations in the UHF band, dial indicator means connected to said control shaft and arranged to provide an exact digital indication of the UHF channel number corresponding to one of said stop positions of said main tuning shaft, said tuning elements of said UHF tuner being aligned to receive the corresponding UHF station at each of said stop positions of said main tuning shaft with a maximum error of approximately one megacycle, whereby the channel indicated by said dial indicator means is nonambiguous, said maximum error of approximately one megacycle being maintained when said combination is fabricated on a production line.

4,037,483

WINDOW OPERATOR MECHANISM

Nestor M. Nadal, Ci 37 Calle Pedro Goyco, Levittown Lakes, P.R. 00950

Filed Apr. 26, 1976, Ser. No. 680,145
Int. Cl.² F16H *19/08*
U.S. Cl. 74—32 **6 Claims**



1. An improved window operator in which each of the components is molded from a polymeric material, the operator being of the type having a housing having a central longitudinal plane, a worm gear rotatably mounted in said housing with the axis of rotation of said worm gear intersecting said plane at an acute angle, a crank handle coupled to said worm gear outside of said housing, a sector gear rotatably mounted in a plane parallel with said central plane with its teeth in engagement with said worm gear to be driven thereby, an arm formed on said sector gear and extending out of said housing, and a link pivotally attached to said arm, said link being connectable to a window closure to operate said closure upon rotation of said crank, the improvement wherein

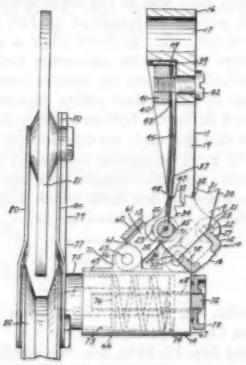
said worm gear is formed with a single helical tooth in the major portion of which the ratio of the axial dimension of the top land to the axial dimension of the root is substantially 4:10.

4,037,484

DERAILLEUR CONSTRUCTION HAVING FIXED INCREMENT MEANS

Milton Morse, 44 Honeck St., Englewood, N.J. 07631

Filed July 21, 1975, Ser. No. 597,436
Int. Cl.² F16H *7/22*
U.S. Cl. 74—217 B **4 Claims**



1. In a bicycle chain derailleur mechanism including a relatively fixed mounting member adapted to be secured to a

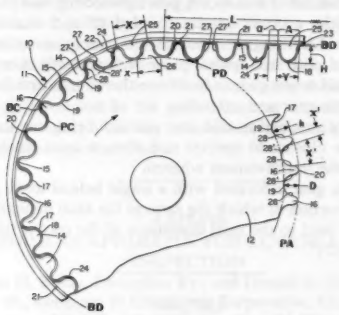
portion of a bicycle frame, a pivot block supporting chain-entraining means, and shiftable laterally of said mounting member to result in moving a continuous segment of a bicycle chain from one hub sprocket to another, first and second parallel trunnions interconnecting said fixed mounting means and said pivot block, the improvement comprising: a generally planar detenting plate supported on one of said trunnions for arcuate movement therewith, said plate having a plurality of detenting recesses arranged in spaced increments corresponding to arcuate displacement of said one of said trunnions in moving said pivot block to predetermined positions to locate said entraining means in co-planar relation relative to given hub sprockets; and a resilient movable detenting member carried by said fixed mounting member and adapted to selectively engage one of said detenting recesses upon movement of said trunnions; whereby said pivot block is resiliently locked into one of said predetermined positions.

4,037,485

BELT DRIVE AND BELTS AND PULLEYS THEREFOR

Ronald D. Hoback, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 18, 1975, Ser. No. 642,090
Int. Cl.[2] F16G *1/28*; F16H *7/00*
U.S. Cl. 74—229 **36 Claims**



1. A belt drive comprising: a flexible power transmission belt having a plurality of alternating teeth and grooves extending generally transversely thereof and a pair of toothed pulleys having a plurality of alternating teeth and grooves extending generally axially thereof which engage with the belt teeth and grooves during the operation of the drive, the dimensional relationship of said belt teeth and grooves and said pulley teeth and grooves being such that in the longitudinal extent of the belt between the pulleys the height of the belt teeth is greater than the depth of the pulley grooves while as the belt travels around the pulleys the extreme outwardly facing portions of the belt teeth which confront the pulleys come into contact with the portions of the toothed pulley disposed between the pulley teeth which define the bottom of the pulley grooves and at the same time said belt teeth are compressed to reduce their height so that the extreme radially outwardly facing portions of the pulley teeth come into contact with the portions of the belt disposed between the belt teeth which define the bottoms of the belt grooves.

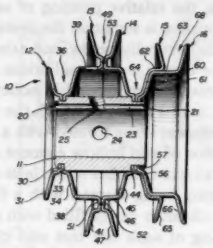
4,037,486

PULLEY

Edward H. Schultz, Jr., Glencoe, Ill., assignor to Nagel-Chase Manufacturing Company, Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,249
Int. Cl.[2] F16H *55/54*
U.S. Cl. 74—230.8 **9 Claims**

1. A multi-groove pulley, comprising the combination of a cylindrical, axially elongated hub, a first non-folded sheet metal member having a base for attachment to the hub and a flange flaring simultaneously radially and axially diagonally outwardly away from the base, and second, third, fourth and fifth sheet non-folded metal members each having a base for attachment to the hub, an inner flange flaring simultaneously radially and axially diagonally outwardly from the base, a sleeve extending axially from the inner flange, and an outer flange flaring simultaneously radially and axially diagonally outwardly from the sleeve, all the sheet metal members being



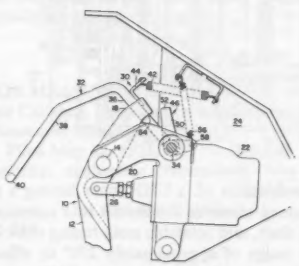
abuttively assembled on the hub for forming a plurality of belt-accommodating grooves wherein said sheet metal members are assembled on said hub in a mutually opposed and aligned array so that the first member flange and second member inner flange form a first belt-accommodating groove, the second and third member outer flanges form a second belt-accommodating groove, the third and fourth member inner flanges form a third belt-accommodating groove, the fourth and fifth member outer flanges form a fouth belt-accommodating groove.

4,037,487

SERVICE BRAKE LOCK MECHANISM

Brian Alvin Ahlschwede, Malcolm, Nebr., and Edwin Lee Whisler, Peosta, Iowa, assignors to Deere & Company, Moline, Ill.

Filed July 14, 1975, Ser. No. 595,847
Int. Cl.[2] G05G *5/06*
U.S. Cl. 74—529 **9 Claims**



1. A control, comprising: a support structure; an elongate manually operable control arm pivotally mounted on the support structure for movement between first and second positions and including an abutment surface located so as to be a trailing surface as the arm moves from its first to its second position; arm biasing means mounted between the support structure and the arm and urging the latter towards said first position; a locking pawl pivotally mounted on the support structure for movement between arm-release and arm-lock positions and including an abutment surface located so as to be in engagement with the abutment surface of the arm when the arm is in its second position and the pawl is in its arm-lock position and so to be free of the arm when the arm is in its first position and the pawl is in its arm-release position; an pawl

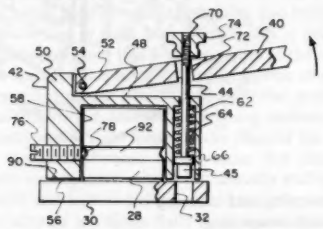
biasing means connected between the support structure and the pawl and biasing the latter towards said arm-lock position; a manually operable control member pivotally mounted on the support structure for movement between pawl-retain and pawl-release positions; said pawl including a second abutment surface located so as to lead when the pawl is moving toward the arm-lock position; said control member including an abutment surface located so as to be in engagement with the second abutment surface of the pawl when the control member is in its pawl-retain position and when the pawl is in its arm-release position; a control member biasing means mounted between the support structure and control member and urging the control member torwards its pawl-retaining position; said control member biasing means urging the abutment surface of the control member against the second abutment surface of the pawl with a force greater than the force exerted on the abutment surface of the control member by the second abutment surface of the pawl as effected by the pawl biasing means; said abutment surface of the control member being located so as to move in a direction away from the second abutment surface of the pawl as the control member is moved from its pawl-retain to its pawl-release position; and said control member and arm having respective manually engageable portions arranged to trace closely adjacent paths with the portion of the control member trailing the portion of the arm respectively during movement of the control member from its pawl-retain to its pawl-release position and during movement of the arm from its first to its second position, whereby an operator may use a single appendage to simultaneously move the arm and the control member when it is desired to lock the arm in its second position.

4,037,488

HANDLE MECHANISM FOR MACHINE TOOLS

Thomas D. Laney, Sr., 6026 SE. Brooklyn St., Portland, Oreg. 97206

Filed Feb. 23, 1976, Ser. No. 660,272
Int. Cl.[2] G05G 1/12; F16D 11/00
U.S. Cl. 74—548 **7 Claims**



1. A handle mechanism for machine tools comprising:

a. a body member having a front portion and a rear portion, said front portion defining a substantially planar face, and means defining a bore extending through said face and into said body member;

b. an elongate handle member hingedly attached to said rear portion of said body member and extending laterally therefrom;

c. an elongate index pin slideably mounted in said body member parallel to the direction of said bore so as to be forwardly extensible beyond said face and rearwardly retractable behind said face; and

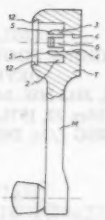
d. fastening means removably positioned proximate a side of said handle member oriented away from said body member and attached to said index pin for coupling said pin directly to said handle member such that movement of said handle member in one direction relative to said body member causes said index pin to retract behind said face and movement of said handle member in an opposite direction relative to said body member causes said index pin to extend beyond said face, said retraction and extension of said index pin being effected solely by movement of said handle member, and for permitting said retraction and extension of said index pin independent of said movement of said handle member, said index pin being completely removable from said body member solely upon detachment of said fastening means.

4,037,489

MECHANICAL DEVICES AND MEANS FOR ROTATING A SHAFT

Henri Morel, Maule, France, assignor to ITW de France, S.A., Beauchamp, France

Filed Aug. 20, 1976, Ser. No. 716,050
Claims priority, application France, Aug. 29, 1975, 75.26673
Int. Cl.[2] G05G 1/00
U.S. Cl. 74—548 **3 Claims**



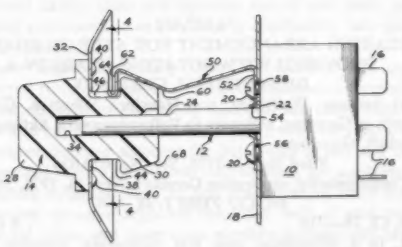
1. Mechanical assembly for driving an axle in rotation comprising means for actuating said axle and means for fixing said actuating means together, wherein said axle comprises an end adapted to receive said actuating means, with, on said end, at least one flat and at least one groove extending over a circular arc situated at right angles with respect to said flat, said actuating means is constituted by a knob or crank-handle head including a central recess adapted to receive said axle end and at least two flexible parts mounted in said recess and arranged at right angles to one another, one of these parts being adapted to bear on said flat and the other provided with a pin adapted to be engaged in said groove and said fixing means is constituted by a ring adapted to encircle and grip said two parts of said actuating means respectively against and in said flat and said groove of said axle end, said ring comprising means adapted to make it itself fast to said actuating means.

4,037,490

TWO-STEP CONTROL KNOB OPERATION

Arthur C. Wilson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1976, Ser. No. 646,415
Int. Cl.[2] H01H 3/10
U.S. Cl. 74—553 **7 Claims**



1. A control knob mounted on the shaft of a control device, said knob comprising:

a. a handle portion; and

b. a hub portion to receive the shaft of the control device, the hub portion including an outer groove with a locking seat;

c. a locking spring means fixed with relation to the control device and cooperating with the groove of the hub portion for releasably holding the knob on the shaft as well as locking the knob from rotation when the locking spring engages the locking seat;

d. the knob being capable of limited longitudinal movement along the shaft;

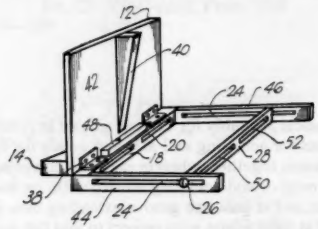
e. the hub portion including release means for withdrawing the locking spring from the locking seat whereby the knob may be rotated to adjust the control device.

4,037,491

SEWING MACHINE FOOT SWITCH OPERATING DEVICE

Zebbie J. Newbold, 3512 NW. 14th Terrace, Miami, Fla. 33125

Filed May 20, 1976, Ser. No. 688,326
Int. Cl.[2] G05G *1/14*; D05B *75/00*; H01H *3/14*
U.S. Cl. 74—561 **9 Claims**



1. A sewing machine foot switch operating device comprising a foot operated treadle, an adjustable four sided rectangular frame, hinging means for hingeably affixing said treadle to said adjustable frame, adjustment means for adjusting the location of one of the sides of said four sided frame, locking means for selectively securing said one of said four sided frame to the two adjacent sides thereto of said four sided frame, an adjustable sized void for the location of a foot switch therewithin, said void contained within a portion of the length of said one side and another side parallel thereto of said four sided frame and a pair of adjustably located rods, said rods parallel to each other and parallel to said two adjacent sides, foot switch operating means for operating a foot switch when said treadle is depressed, heel rest means extending outwardly from said treadle for retention of the heel of the user.

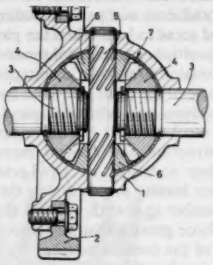
4,037,492

BEARING ARRANGEMENT FOR AXLE OR SHAFTS PROVIDED WITH ROTATING GEARS IN A DIFFERENTIAL GEAR BOX

Karl Ashauer, Wolfsburg, and Hansjorg Mihatsch, Gifhorn, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany

Filed Nov. 5, 1975, Ser. No. 629,030
Claims priority, application Germany, Nov. 14, 1974, 2454067
Int. Cl.[2] F16H *1/38, 1/40*
U.S. Cl. 74—710 **6 Claims**

1. In a differential gear box containing rotatable gears mounted on shafts extending through the gear box and having bearing rings positioned between the gears and the gear box, each of the bearing rings encompassing a shaft of a respective gear, the improvement wherein each of the bearing rings is joined to at least one adjacent bearing ring by a web to form an unitary bearing ring structure which includes all the bearing



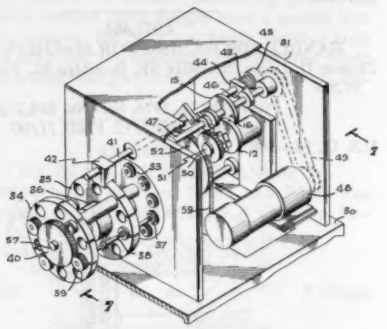
rings, whereby entrainment of the bearing rings resulting from rotation of the gears on the shafts is prevented.

4,037,493

POSITIONING AND INDEXING APPARATUS

Edgar P. Freer, 7000 Scarborough Peak Drive, Canoga Park, Calif. 91307

Filed May 27, 1975, Ser. No. 580,601
Int. Cl.[2] B23B *9/24*
U.S. Cl. 74—820 **8 Claims**



1. Positioning and indexing apparatus comprising:

a frame;

a platform movably carried on said frame;

an index means fixedly secured to said platform so as to move therewith;

driving means selectively engageable with said index means for imparting movement to said platform;

means interconnecting said driving means with said platform via said index means to a predetermined number of positions whereby each position is a precise dimension from adjacent positions;

stop mechanism carried on said frame and operable with respect to said index means for releasably retaining said platform in each of said predetermined positions;

said index means includes a plurality of equally spaced-apart slots formed in the periphery of said platform outwardly radiating from the center thereof;

said driving means includes a pin outwardly projecting from said driving means selectively engageable with said index slots in a serial sequence;

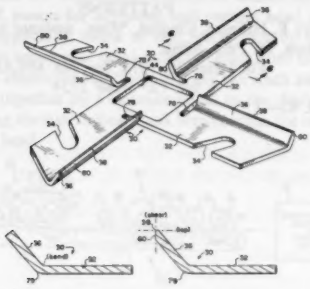
said driving means includes a drive wheel having its center of rotation beyond the periphery of said index means and carrying said pin on its side face offset from its center thereof.

4,037,494

METHOD OF PRODUCING A RADIAL ARM-TYPE MEAT GRINDER CUTTER BLADE

Charles W. Hess, Schiller Park, Ill., assignor to Speco, Inc., Schiller Park, Ill.

Division of Ser. No. 659,941, Feb. 20, 1976, Pat. No. 3,993,255.
This application May 26, 1976, Ser. No. 690,199
Int. Cl.[2] B21K *1/76*
U.S. Cl. 76—101 A 3 Claims



1. The method of producing a radial arm-type cutter blade for a rotary meat grinder, which comprises the steps of stamping a blank from a horizontally disposed sheet of flat metal of predetermined thickness so as to provide a plurality of flat radially and horizontally extending blank arms which are, in part, separated from the central hub part by narrow slits which intersect and extend rearwards from the base regions of the leading side edges of the arms and terminate short of the base regions of the trailing side edges of said arms, while at the same time providing a non-circular drive opening in the hub part, bending the leading side marginal portions of the arms upwardly along radial lines between the leading and trailing side edges of the arms and at right angles to the slits in order that they extend outwardly and upwardly at angles of the order of 45°, and then shearing the outer side edge regions of the outwardly and upwardly bent leading side marginal portions of the arms so as to form flat, inner, meat-pushing surfaces which extend vertically and at right angles to the plane of the unbent trailing side marginal portions of the arms, and flat, outer surfaces which are coplanar, extend horizontally and in parallel relation with said unbent trailing side marginal portions of the arms, are adapted to engage flatly the inner surface of the perforated grinder plate of the meat grinder in which the cutter blade is used, extend at right angles to the inner meat-pushing surfaces, and join the latter in right-angle shearing edges.

4,037,495

FLEXIBLE STRAP WRENCH

Donald M. Beckstead, 4944 No. 13 Navy Road, Millington, Tenn. 38053

Filed Aug. 27, 1976, Ser. No. 703,987
Int. Cl.[2] B25B *13/52*
U.S. Cl. 81—64 6 Claims

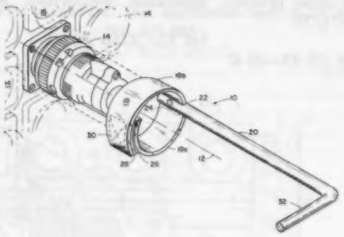
1. A tool for rotating an object comprising:

a flexible strap having two free ends capable of being formed into a loop to receive the object to be rotated;

means for adjustably securing together the free ends of said strap;

a shaft secured to said strap intermediate the ends and extending in a direction normal to a peripheral plane containing said loop;

whereby objects can be rotated from an axially remote position.

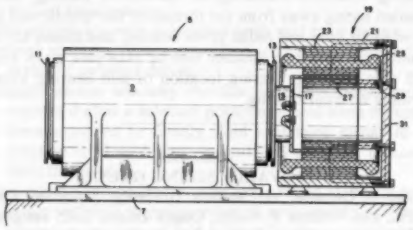


4,037,496

COMBINATION SPINDLE-DRIVE SYSTEM FOR HIGH PRECISION MACHINING

Howard L. Gerth, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 1, 1976, Ser. No. 719,637
Int. Cl.[2] B23B *19/02*
U.S. Cl. 82—28 R 4 Claims



1. A combination spindle-drive for a precision machining lathe comprising:

a spindle having a rotatably disposed shaft adapted to carry a workpiece at one end of said shaft;

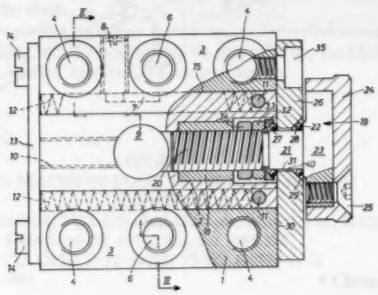
a cup-shaped rotor supported in cantilever arrangement from the opposite end of said shaft by affixing the base of said cup-shaped rotor concentrically to the said opposite end of said shaft so that the walls of said cup-shaped rotor extend axially from said opposite end of said shaft, said rotor composed of an electrically conductive, non-magnetic material;

a stator disposed coaxially about the walls of said cup-shaped rotor in an adjacent spaced relationship from said rotor, to form air gaps along the outer and inner walls of the said cup-shaped rotor, said stator having an outer core member disposed adjacent the outer wall of said cup and provided with a poly-phase AC winding for applying a rotating magnetic field to said rotor and an inner core member disposed adjacent the inner wall of said cup-shaped rotor, said inner core member magnetically coupled to said outer core member so that the magnetic flux produced by said winding circulates through the walls of said cup-shaped rotor to produce torque on said rotor due to the reaction of eddy currents induced in said rotor by said rotating magnetic field.

4,037,497
TOOL HOLDER WITH FINE INFEED

Fritz Angst, Breitenmatt 1362, Oberdurnten, Switzerland

Filed Aug. 31, 1976, Ser. No. 719,208
Claims priority, application Switzerland, Sept. 9, 1975, 11671/75
Int. Cl.² B23B 29/00
U.S. Cl. 82—36 R 8 Claims

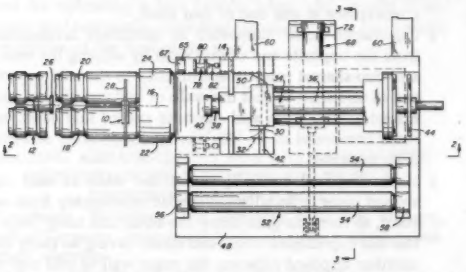


1. A tool holder with fine infeed, comprising a base body, a slide, means for displaceably guiding the slide in said base body, said slide being adapted to receive a work tool, an infeed-threaded spindle threadably retained in said slide, said threaded spindle having thread play, at least one spring for eliminating said thread play, means for providing three axial bearing locations and two radial bearing locations for mounting the spindle with respect to the slide and the base body, said bearing locations including an outermost bearing location situated facing away from the threads of the spindle and structured as an axial and radial pivot bearing, and means for interconnecting with one another free of play said pivot bearing and a neighboring bearing location of said bearing locations forming an axial bearing.

4,037,498
MOVABLE SIZING GAUGE

Evans D. Dorman, McCandless Township, Allegheny County, Pa., and William P. Getty, Odgen Dunes, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1976, Ser. No. 716,912
Int. Cl.² B23B 5/14
U.S. Cl. 82—86 7 Claims



1. In apparatus for cutting segments from elongated stock including a conveyor for moving said stock along a pass line, cutting means adjacent the end of said conveyor, means beneath the end of said conveyor for the gravity discharge of segments and an adjustable sizing gauge including a stop head operatively positioned. in said pass line to be abutted by the end of said stock after said end has passed beyond said cutting means, the improvement comprising:

a. a movable carriage mounting said sizing gauge;

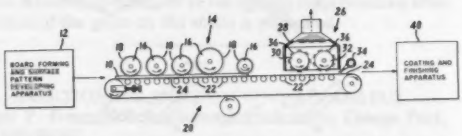
b. means for moving said carriage transversely of said pass line; and

c. means on said carriage forming a receptacle to receive stock from said conveyor when said conveyor is moved to position said sizing gauge out of alignment with said pass line.

4,037,499
METHOD AND APPARATUS FOR PERFORATING FIBROUS BOARD SURFACES IN NON-REPETITIVE PATTERNS

Theodore E. Hillman, Cloquet, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Jan. 26, 1974, Ser. No. 652,427
Int. Cl.² B26F 1/24
U.S. Cl. 83—1 7 Claims



1. Apparatus for fissuring a fibrous board product of predetermined thickness comprising:

a. a substantially flat surface;

b. a plurality of rolls positioned above said surface, each said roll have an outer periphery;

c. a plurality of perforating members randomly spaced on the outer periphery of each said roll;

d. the distance from the ends of the said perforating means to the said flat surface being less than the predetermined thickness of the board product;

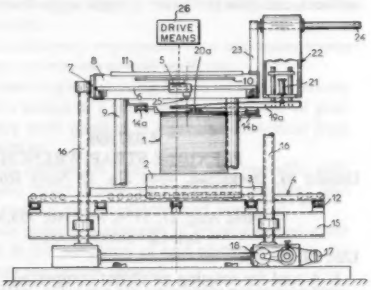
e. means for passing said board product between the said flat surface and the said plurality of rolls; and

f. said perforating members being loosely secured in said rolls, whereby said perforating members are moveable with respect to their respective rolls.

4,037,500
PROCESS AND APPARATUS FOR CONTINUALLY CUTTING STACKED GLASS SHEETS

Raymond Vatin, Thourotte, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Mar. 23, 1976, Ser. No. 669,595
Claims priority, application France, Mar. 27, 1975, 75.09733
Int. Cl.² B26D 3/08; B65H 3/08
U.S. Cl. 83—7 14 Claims



1. A process for continually cutting glass blanks comprising moving a stack of blanks into position beneath a cutting head carrying a scoring tool and having a reference templet associated therewith, bringing said scoring tool into contact with the uppermost blank of said stack and actuating the cutting

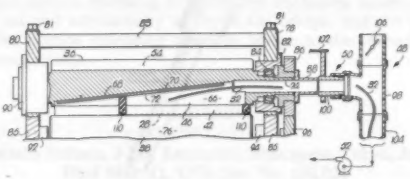
head to produce a score line in the uppermost blank under guidance of said templet, withdrawing the cutting tool from the uppermost blank and removing the blank from the stack to expose the next uppermost blank, relatively moving the stack and cutting head closer together by a distance equal to the thickness of a blank, and repeating the actuation of the cutting head to produce a score line in the then uppermost blank of the stack under guidance of said templet.

4. Apparatus for continually cutting glass blanks comprising a cutting head and a templet for guiding the movement thereof, support means for supporting a stack of blanks beneath the cutting head, means for actuating said cutting head to score a line in the uppermost blank of said stack, pick-up means for removing the uppermost blank from the stack after the scoring thereof, and means for relatively moving the stack and cutting head closer together by a distance equal to the thickness of a blank to bring the succeeding blank into position for scoring by said cutting head.

4,037,501
THROUGH-THE-CYLINDER SLUG OUT DEVICE

Dean E. Gladow, Emporia, Kans., assignor to Didde-Glaser, Inc., Emporia, Kans.

Filed June 21, 1976, Ser. No. 698,115
Int. Cl.² B26F *1/38*
U.S. Cl. 83—100 **20 Claims**



1. A web-cutting assembly equipped for through-the-cylinder slug removal, said assembly comprising:

an elongated, axially rotatable cutting cylinder;

an elongated, axially rotatable anvil cylinder adjacent said cutting cylinder,

said cutting and anvil cylinders cooperatively presenting a web-receiving and cutting nip area therebetween;

at least a pair of spaced cutting elements mounted on the periphery of said cutting roll and operable for successively cutting slugs from a web passing through said nip area as the cutting and anvil cylinders rotate,

at least one of said cylinders including structure defining an elongated, axially and inwardly extending slot therein which is adapted for slug-receiving alignment with said pair of elements during cutting of said slugs for receiving the latter,

said slot-defining structure including spaced, opposed sidewall portions and a bottom wall portion which is tapered inwardly from a point adjacent one end of the roll to the opposite end thereof;

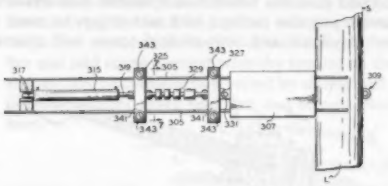
slug-conveying structure including means located adjacent said opposite end of said one roll and proximal to the axis of the latter and in communication with said slot for conveying cut slugs from the slot; and

structure rotatably supporting said cutting and anvil cylinders in web-receiving and cutting disposition.

4,037,502
LOG POSITIONERS

Paul J. Westfall, 4444 W. Burnside, Portland, Oreg. 97210

Continuation-in-part of Ser. No. 425,288, Dec. 17, 1973, Pat. No. 3,906,829, which is a continuation-in-part of Ser. No. 264,739, June 21, 1972, abandoned. This application Sept. 8, 1975, Ser. No. 610,984
Int. Cl.² B27B *29/10*
U.S. Cl. 83—726 **5 Claims**



1. An actuating assembly for a head rig having a log carriage and knee means movable along the carriage to variously locate a log relative to a saw,

comprising setwork means on the carriage including a series of bottoming out cylinder drives having varying effective lengths,

the piston of each cylinder drive being connected to the cylinder of the adjacent cylinder drive whereby the movement of each piston is additive to the movement of each of the other pistons,

means for energizing the cylinder drives selectively to differently locate the knee means and thereby the log with relation to the saw,

said series of cylinders having a head end in driving relation to said knee means,

first stopping means associated with said knee means,

second stopping means associated with the rear end of said series of cylinder drives,

control means whereby the first stopping means may be activated after a selected position of said knee means has been achieved to fixedly hold said knee means in said position until such time as said first stopping means has been inactivated,

said control means inactivating said second stopping means while said first stopping means is activated to enable collapsing movement of said series of cylinders without distrubing the position of said knee means,

said means connected to the rear ends of said series of cylinders for collapsing the same to condition the same for full extension when the second stopping means is subsequently activated and said first stopping means is activated.

4,037,503
POWER OPERATED GUITAR DEVICE

Evan C. Jacobson, 6479 Rendina St., Long Beach, Calif. 90815, and Stephen R. Becker, 1525 Freeman Ave., Long Beach, Calif. 90804

Continuation-in-part of Ser. No. 500,028, Aug. 23, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,304
Int. Cl.² G10F *1/20*; G10D *3/16*
U.S. Cl. 84—9 **18 Claims**

1. In combination with a musical stringed instrument that includes a rigid body bearing an elongate keyboard, a bridge secured to a first side of said body, and a plurality of laterally spaced tensioned strings that extend longitudinally the length of said keyboard and across said bridge, and means on said keyboard and body for engaging end portions of said strings to maintain the latter in a tensioned condition, power operated means for selectively vibrating each of said strings individually or in unison with other of said strings, said power operated means including:

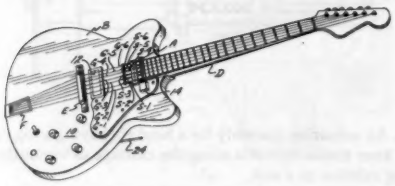
a. a plurality of laterally spaced, elongate shafts that are

spaced from said strings and substantially parallel thereto, with each of said shafts including first and second ends;

b. a plurality of rotatable members mounted on said first ends of said shafts that cause said strings to vibrate and emit a musical tone when brought into rotatable pressure contact therewith;

c. power means for rotating said shafts; and

d. manually actuated means for selectively moving said shafts and rotatable members from first positions where said rotatable members are out of contact with said strings to second positions where said rotatable members are in rotatable pressure contact with said strings to cause the latter to vibrate and emit musical tones, said manually



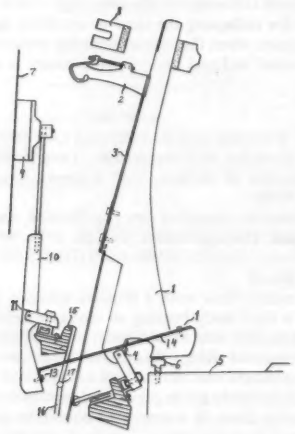
actuated means including a support means extending transversely across said strings and secured to said first side, said support means carrying receptacle means to slidably receive a plurality of pins; a plurality of pins slidably mounted in said receptacle means, said pins having first and second ends; a plurality of buttons mounted on said support means and bearing on the first ends of said pins; a plurality of bearings mounted on said second ends of said pins that rotatably support said shafts; and spring means that at all times tend to maintain said buttons, pins, shafts, rotatable members and gears in said first position, but each of said rotatable members being selectively movable to said second position by applying manual pressure to said button associated therewith.

4,037,504

DEVICE IN A PIANO MECHANISM

Gunnar Sjöstrand, Onhult Box 268 A, Atvidaberg, Sweden

Filed Oct. 1, 1975, Ser. No. 618,360
Claims priority, application Sweden, Oct. 14, 1974, 7412876
Int. Cl.[2] G10C *3/18, 3/00*
U.S. Cl. 84—255 3 Claims



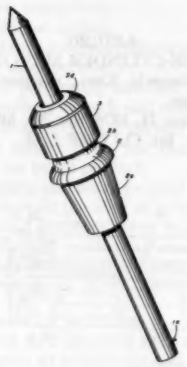
1. In piano mechanism for controlling the movement of a damper in coordination with the movement of a hammer, said damper being mounted on an elongated damper arm which is journalled on an axis, the improvement which comprises an elongated hammer arm mounted for movement toward and away from a piano string, and an elongated damper lifter means firmly connected to the hammer arm close to the end remote from the hammer and to the damper arm on the opposite side of said axis with respect to the damper, said damper lifter means being longitudinally unyielding in both directions whereby said damper arm is positively moved away from and toward said string in response to movements of the hammer arm in the respective opposite directions.

4,037,505

ADJUSTABLE END PIN FOR STRING BASS OR CELLO

Lea Maples, 84 Orchard Estates Drive, Walnut Creek, Calif. 94598

Filed Apr. 19, 1976, Ser. No. 678,152
Int. Cl.[2] G10D *1/02, 3/00*
U.S. Cl. 84—280 3 Claims



1. For use in combination with a string instrument, of the string bass or cello type, having a socket in the bottom end for receiving a height adjusting pin; the improvement in the assembly of such pin comprising a hub having a tapered end portion which snugly fits into said socket, a cylindrical collar surrounding the opposite end portion of said hub, an end pin freely extending through said hub and collar, a substantially annular jam plate extending angularly through an angular cavity in said collar and having a central hole surrounding said end pin, a helical spring surrounding said end pin and having one end seated in said hub and the other end in engagement with said jam plate so as to normally urge the jam plate in angular relationship with the longitudinal exis of said end pin so as to wedge against two diametrically opposite, longitudinally spaced portions of said end pin to prevent it from moving longitudinally relative to said hub, said collar having an internal shoulder portion which is engageable with a peripheral portion of said jam plate upon movement of said collar toward said tapered portion of the hub and against a fulcrum portion of the hub within said collar, whereby said jam plate will tip as a lever about said fulcrum point against the action of said spring to free said end pin and allow it to be pulled away from said tapered portion to permit selective withdrawal of said end pin away from said tapered portion to enable incremental adjustment of the height of the instrument from a floor.

4,037,506
STRINGS FOR MUSICAL INSTRUMENTS

James Charles How, Bexleyheath, England, assignor to James How Industries Limited, Kent, England

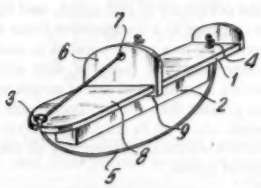
Continuation of Ser. No. 470,286, May 15, 1974, abandoned.
This application Aug. 28, 1975, Ser. No. 608,802
Claims priority, application United Kingdom, May 20, 1973, 13182/73
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—297 S 3 Claims

1. A fingerboard type stringed musical instrument having a nut and a bridge, a first anchoring means beyond the nut, a second anchoring means beyond the bridge, and a metal string of which a first portion is loaded and of which a second contiguous portion is non-loaded, the string being disposed with the loaded portion extending from the first anchoring means over the nut and substantially as far as the bridge, and the non-loaded portion extending over the bridge to the second anchoring means.

4,037,507
CAPO TASTO

Masataka Shibata, 2-2-3, Kamiosaki, Shinagawa, Tokyo, Japan

Filed Mar. 11, 1976, Ser. No. 666,021
Claims priority, application Japan, Mar. 14, 1975, 50-65668[U]
Int. Cl.[2] G10D *3/04*
U.S. Cl. 84—318 5 Claims

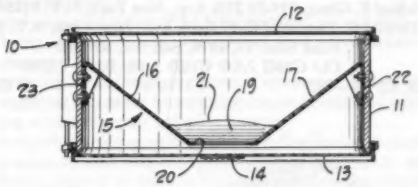


1. A capo tasto comprising:
a first plate member, generally rectangular in configuration, said first plate member having a notch at one end thereof;
a second plate member, generally rectangular in configuration, said second plate member being smaller in area than said first plate member, said first plate member being secured to and superposed over said second plate member;
a tension control member having at one end thereof a centrally located generally T-shaped slot formed longitudinally therein and having substantially parallel side walls, said slot having upper and lower sections, the width of said upper section being greater than the width of said lower section, said first plate member being slidingly receivable in said upper slot section, and said second plate member being slidingly receivable in said lower slot section; and
a string element, one end thereof being secured to the end of said first plate member opposite that having the notch, the other end of said string element being slidingly received in the notch of said first plate member and secured to the tension control member, there being a space defined between said second plate member and said string element for receiving the neck of a guitar, said guitar neck being subject to compresion from both said second plate member and said string element whereby tension on the guitar strings may be continuously varied by sliding said tension control member along said first and second plate members.

4,037,508
SNARE DRUM

John W. Wolford, P.O. Box 1024, Dundee, Fla. 33838

Filed July 1, 1976, Ser. No. 701,951
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—415 2 Claims



1. In combination with a snare drum, a ventrasonic acoustic-chamber adapted to interfit the interior of the snare drum between the batter and snare heads and clear of the drum shell, comprising;
a. a hollow circularly shaped body, open at the top and bottom, having angularly inclined side and end walls extending upwardly from a rectangularly shaped orifice at the lower edge thereof;
b. said bounding side and end walls being flat and outwardly inclined at an approximate 40° angle to the plane of the orifice;
c. the orifice being aligned with the snare and spaced upwardly of the snare head; and
d. the upper rim of the side and end walls being spaced from the batter head and clear of the drum shell.

4,037,509
PRACTICE CYMBAL COVER

Ralph Slomovits, 19200 Roseland Ave., Euclid, Ohio 44117

Filed Dec. 29, 1975, Ser. No. 644,523
Int. Cl.[2] G10G *7/00*
U.S. Cl. 84—422 R 6 Claims

1. A practice cover for a cymbal for covering at least a major portion of the upper surface of the cymbal and providing a resilient surface which may be struck by a percussion stick, said practice cover comprising a substantially circular member of resilient material having a diameter approximately equal to the diameter of the cymbal to be covered, said resilient member including an annular opening disposed in the center thereof having a diameter substantially equal to the diameter of the bell portion of the cymbal to be covered, said annular opening allowing the substantially circular member of resilient material to overlie and be in substantially continuous contact with the upper surface of the cymbal to provide a surface to be struck by a percussion stick which simulates the action of the

cymbal on the percussin stick while muffling at least eighty percent of the noise normally associated with the cymbal and

means disposed in the center of said member for securing said resilient member in a position overlying the upper surface of the cymbal.

4,037,510

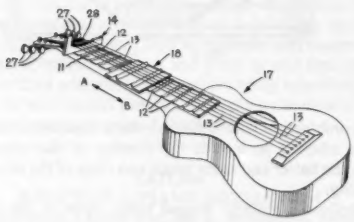
FRET REFINISHING APPARATUS AND METHOD

Michael F. Ginex, 119-59 27th Ave., New York, N.Y. 11354, and Donald E. Thomas, 143-57 Rose Ave., New York, N.Y. 11355

Filed Mar. 17, 1976, Ser. No. 667,900

Int. Cl.[2] G10G *7/00*; G10D *3/06*; B24D *15/00*

U.S. Cl. 84—453 **12 Claims**



1. An apparatus for refinishing a fret on the fingerboard of a fretted stringed instrument,

comprising in combination

a flat tool having two substantially parallel sides, a first side supporting abrasive material disposed substantially in a first plane, and

a second side disposed substantially in a second plane with elongated portions raised above said second plane and supporting abrasive material on said raised elongated portions.

4,037,511

TEACHING DEVICE FOR ATTACHMENT TO AN ORGAN

Juan M. Del Castillo, Risco 119, Mexico City, Mexico

Filed Dec. 30, 1975, Ser. No. 645,374

Int. Cl.[2] G09B *15/08*

U.S. Cl. 84—478 **17 Claims**

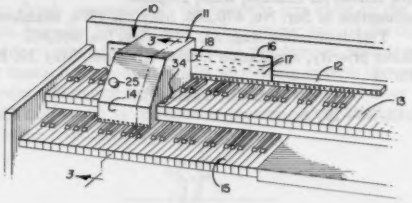
1. A teaching device for use with a musical instrument having an upper and a lower keyboard comprising

a main housing resting on the upper keyboard,

an elongated housing extending from said main housing and along the rear of the upper keyboard along a portion of the upper keyboard,

a record sheet having indications thereon in accordance with music to be played on the musical instrument, means to move said record sheet through at least said main housing,

means mounted in said elongated housing and said main housing in a position to designate in accordance with said



record sheet the keys on the upper and lower keyboards which are to be pressed.

4,037,512

WIRE NAIL

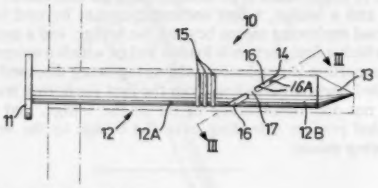
B. E. Ingvar Sundberg, Tyreso, Sweden, assignor to Nordisk Kartro Aktiebolag, Sweden

Filed Oct. 24, 1974, Ser. No. 517,621

Claims priority, application Sweden, Oct. 24, 1973, 7314419; Oct. 24, 1973, 7314420

Int. Cl.[2] F16B *13/04*

U.S. Cl. 85—79 **5 Claims**



1. A wire nail comprising:

a. a metal shank having a solid front end adapted to be driven into a holding structure, and a solid rear end having a head;

b. said shank having at least four flat parallel wedge faces between said ends and defining at least two slots extending at an acute angle from the outside of said shank toward its axis; and

c. a web-like ligament of metal, said ligament having at least three radially outermost circumferentially spaced ends flush with the periphery of said shank, said ligament being yieldable in response to a compressive force applied to the nail ends and lying in a plane parallel to said acute angle and interconnecting said faces of said solid ends, said ligament having a continuous extent across said shank and in said plane greater than the transverse size of said shank taken perpendicularly to its length and having at least one web-like portion extending traversely to the direction of said continuous extent.

4,037,513

COTTER PIN

Stephan C. Hobson, Buffalo Grove, Ill., assignor to Portec, Inc., Oak Brook, Ill.

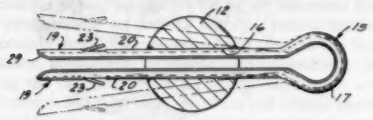
Filed Sept. 3, 1976, Ser. No. 720,401

Int. Cl.[2] F16B *21/14*

U.S. Cl. 85—8.3 **4 Claims**

1. In a cotter pin and in combination with a fastening member having a transversely extending apertured portion having a circumferential inner periphery with said cotter pin being positioned within said apertured portion, said cotter pin having a bight portion at one end and opposed legs extending from

said bight portion and biased outwardly relative to each other to normally extend at predetermined equal angles with respect to the longitudinal center of the cotter pin, said legs of said cotter pin being spaced apart throughout their length in said apertured portion and being adapted to fit through apertured portions of various diameters by compressing said legs toward each other, said legs having outer ends projecting beyond said fastening member and a locking arm extending outwardly of each of said legs adjacent the outer ends of said legs and formed integrally therewith and having free ends facing the fastening member and retaining said cotter pin in position in said fastening member by the bias of said legs, without deforming the free ends of said legs the dimension between the free ends of said locking arms when said legs are compressed into diametrically opposed engagement with each other being



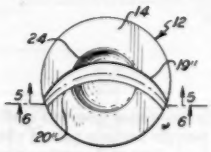
greater than the maximum transverse dimension of said apertured portion whereby said locking arms prevent accidental removal of the cotter pin should said legs be inadvertently pressed into engagement with each other, said outer surfaces of said legs having a shape corresponding to the shape of the apertured portion, and the inner surfaces of said legs being concave throughout the length thereof including the outer ends, said locking arms being formed integrally of said legs and said locking arms being released to accommodate removal of the cotter pin from said apertured portion by pressing said legs together and then moving said legs laterally of each other in opposite directions and partially nesting the ends of said legs relative to each other to clear the ends of said locking arms from the apertured portion and thereby permit ready removal of the cotter pin.

4,037,514

HIGH TORQUE FASTENER HEAD

Juan Andres Lliteras, 6146 Beachway Drive, Falls Church, Va. 22041

Filed Feb. 23, 1976, Ser. No. 660,534
Int. Cl.² F16B *23/00*
U.S. Cl. 85—45 **5 Claims**



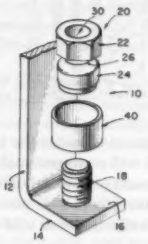
1. A fastener having a threaded shank portion and an integral head portion, said head portion having an arcuate slot formed therein, said arcuate slot intersecting the longitudinal axis of said shank portion, said slot consisting of a pair of arcuate side walls, each side wall being on the opposite sides, respectively, of said longitudinal axis and parallel thereto so that a line traversing the center of said slot and intersecting said longitudinal axis is arcuate, each said arcuate side wall being contained within a cylindrical surface of revolution, said surface of revolution converging towards one another at each end thereof whereby, for a given screw head size, said slot is longer and affords an extensive area of arcuate, surface to surface contact between a correspondingly arcuate driving implement to thereby distribute torque forces more evenly throughout the body of the fastener, and thereby allowing a greater torque force to be applied without the risk of injuring the slot or user by deformation or slippage of the implement in the slot.

4,037,515

TAMPER RESISTANT FASTENER

David A. Kesselman, 1183 Elm Ave., Sonoma, Calif. 95476

Filed Aug. 26, 1976, Ser. No. 717,763
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 **11 Claims**



1. A tamper resistant fastener comprising:

a threaded stud;

a stud engaging means threadably engaged on said stud and being devoid of any disengaging tool accommodating means;

a gripping means engaging portion connected to said stud engaging means for transmitting torque to said stud engaging means from the gripping means;

a frangible neck connecting said gripping means engaging portion to said stud engaging means, said frangible neck being adapted to fracture when a predetermind torque is applied to said gripping means engaging portion to separate said gripping means engaging portion from said stud engaging means; and

a cylindrical slip ring for preventing a gripping instrument from applying a gripping force to said stud engaging means for turning said stud engaging means to remove the fastener, said slip ring surrounding said stud engaging means and slidably connected thereto to freely rotate about said stud engaging means when said gripping means engaging portion is separated from said stud engaging means and having locking means thereon engaging said stud engaging means for preventing said slip ring from moving axially of said stud, said slip ring being spaced closely adjacent said stud engaging means about the entire periphery of said stud engaging means, said close spacing defining means preventing insertion of a disengaging device between said stud engaging means and said slip ring.

4,037,516

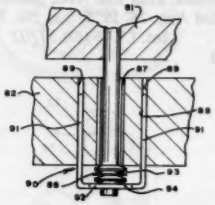
SAFETY DEVICE AND METHOD

Mark M. Hart, 37 Huntleigh Woods, St. Louis, Mo. 63131

Filed Oct. 24, 1975, Ser. No. 625,584
Int. Cl.² F16B *31/02*
U.S. Cl. 85—62 **3 Claims**

1. A safety device for detecting and signaling relative movement of near and far parts of a structure both toward and away from one another, comprising a shank extending slidably through said near structure part and having one end anchored in said far structure part, and another, outer, end projecting beyond said near structure, said shank having a stop in the form of an annular collar on its said projecting part but spaced toward the near structure part from the outermost end of the said shank, a first annular wafer mounted on and around said shank between said collar and said near structure part, said first wafer being hollow, rupturable, and having a flowable material sealed within it, a leg secured only to said near structure part

and carrying a ring, slidably mounted around the said outer end of said shank and spaced from said collar, and a second annular wafer mounted on and around said shank between said ring and said shank collar, said second wafer being hollow, rupturable, and having a flowable material sealed within it,



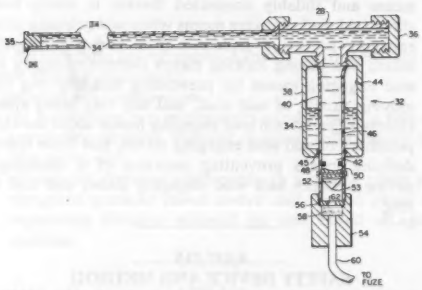
whereby relative movement of said collar in a direction toward said near structure part will compress said first wafer between said collar and said structure, and relative movement of said collar in a direction away from said near structure part will compress said second wafer between said collar and said ring.

4,037,517

FUZE ACTIVATION DEVICE

George S. Briggs, Adelphi, and Hugh H. Snider, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1976, Ser. No. 726,385
Int. Cl.[2] F42C *15/12, 15/40*
U.S. Cl. 89—1.5 D **32 Claims**



1. A sensor and energy source for detecting and registering bomb ejection and for generating an energy signal which comprises:

a crushable container having a substantially incompressible working substance;

a movable impact element positioned adjacent one end of said container, said element movable in response to displacement of said working substance; and

means positioned adjacent to and responsive to said impact element for generating an energy output signal,

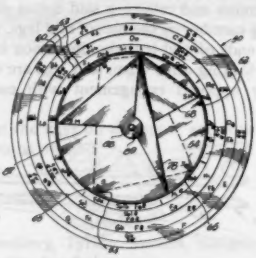
whereupon bomb ejection, said container is crushed to displace the working substance, forcing said impact element against said energy generating means to produce an output control signal associated with bomb ejection.

4,037,518

MUSICAL CHORD AND NOTE CALCULATOR

Felix Hector Garcia Lorenzen, Dolores 265, Villa Sarmiento, Ramos Mejia, Buenos Aires, Argentina

Filed Oct. 9, 1975, Ser. No. 621,205
Claims priority, application Argentina, Oct. 11, 1974, 25606610; Apr. 25, 1975, 258512
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—474 **32 Claims**



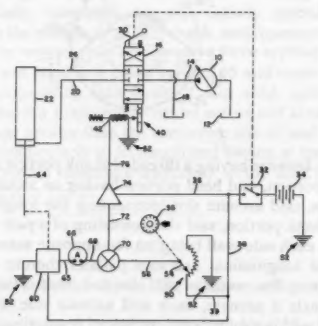
1. A chord calculator comprising a main disk having a central upstanding spindle and spaced from and centered on said spindle a circularly annular array of twelve angularly equispaced indicia corresponding to the notes of the chromatic scale; a plurality of chord indicators each having a central hole adapted to fit over said spindle and each fitting within said array, each chord indicator having at least three and at most four formations one of which is alignable with a chord root note and the others of which are alignable with the other notes of a respective basic chord; and a plurality of interval indicators for adding additional notes to said basic chord, each of said interval indicators being of generally triangular shape and having one apex formed with a throughgoing hole adapted to fit over said spindle and two other apices alignable respectively with a chord root note and with another note spaced by a musical interval of a third from the next lower note.

4,037,519

HYDRAULIC SYSTEM

Wayne Russell Miller; Jan Vilas Seipp, both of Dubuque, Iowa, and Garn Farley Penfold, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 21, 1975, Ser. No. 570,230
Int. Cl.[2] F01B *25/26, 31/12*
U.S. Cl. 91—1 **5 Claims**



1. An electro-hydraulic system comprising: a fluid reservoir; a fluid source of pressurized fluid; fluid function means providing a mechanical output and having at least one port; fluid passage means connected to the port; function control means operatively associated with the fluid source and the reservoir

for controlling pressurized fluid in the fluid passage means and positionable to normally block or selectively connect the fluid source and the reservoir from and to the fluid passage means; manually operable input means operatively associated with the function control means providing an input for selectively positioning the function control means; releasable means intermeshable with the function control means and the input means for positively holding the function control means in a hold position connecting the fluid source to the fluid passage means and to cause the releasable means to withdraw from mesh with the function control means in response to a manual input positioning the function control means away from the hold position or to an electrical release current; an electrical current source, function sensor means operatively associated with the function means and providing an electrical output current proportional to the function means mechanical output; manually operable limiting means providing an electrical limiting current proportional to desired function means mechanical output; control means operatively associated with the function sensor means, the limiting means, and the releasable means for comparing the function sensor means output current and the limiting current and providing the electrical release current to the releasable means when the output current is equal or greater than the limiting current; and power switching means responsive to the input means positioning of the function control means in and away from the hold position to connect and disconnect, respectively, the electrical current source to and from the function sensor means, the limiting means, and the control means to provide electrical current thereto.

4,037,520

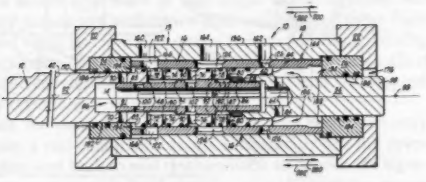
FLUID MOTOR APPARATUS

Herbert Edward Jakob, 8 Pritchard Lane, Taylors, S.C. 29687

Filed Aug. 29, 1975, Ser. No. 608,883

Int. Cl.[2] F01L *15/12, 25/04, 21/02;* **F01B** *7/18*

U.S. Cl. 91—224 **8 Claims**



1. A pressure fluid operated motor comprising:

a barrel assembly having a piston support bore, an inlet port means, and an outlet port means;

a piston, having a piston bore disposed therein, supported by the barrel assembly in the piston support bore, the piston movable alternately in a first direction and in a second direction, and the piston having a first piston pressure face and a second piston pressure face larger than the first piston pressure face, the first piston pressure face forming with the barrel assembly a first piston actuating chamber having continuous fluid communication with the inlet port means, and the second piston pressure face forming with the barrel assembly a second piston actuating chamber; and,

valve spool means supported by the piston for selectively communicating inlet pressure fluid from the inlet port means to the second piston actuating chamber, the valve spool means characterized as comprising a trapped fluid means for preventing mechanical impact between the valve spool means and the piston and the valve spool means further characterized as comprising a valve spool disposed in the piston bore for movement therein the valve spool having a first positional mode wherein the valve spool has moved maximally in the second direction in relation to the piston, and the valve spool having a second positional mode wherein the valve spool has moved maximally in the first direction in relation to the piston, and the trapped fluid means characterized as comprising:

a first spool pressure face portion of the valve spool forming with the piston a first spool actuating chamber, the first spool actuating chamber forming a trapped fluid chamber when the valve spool is in the first positional mode;

a second spool pressure face portion of the valve spool forming with the piston a second spool actuating chamber, the second spool actuating chamber forming a trapped fluid chamber when the valve spool is in the second positional mode;

passage means for selectively providing fluid communication between the first spool actuating chamber and the inlet port means, and between the first spool actuating chamber and the outlet port means; and,

passage means for selectively providing fluid communication between the second spool actuating chamber and the inlet port means, and between the second spool actuating chamber and the outlet port means.

4,037,521

NOISE REDUCTION

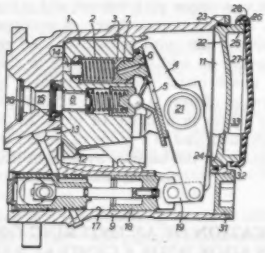
Donald Patterson McLeod, Cheltenham, England, assignor to Dowty Hydraulic Units Limited, Cheltenham, England

Filed Jan. 26, 1976, Ser. No. 652,314

Claims priority, application United Kingdom, Jan. 24, 1975, 3221/75

Int. Cl.[2] F01B *3/02, 13/04*

U.S. Cl. 91—499 **6 Claims**



1. An axial piston machine, comprising a casing, a cylinder block within the casing, having a plurality of cylinders therein, parallel or nearly parallel to a central axis, a piston in each cylinder, a swash plate located at one end of the cylinder block and engaging the pistons projecting from the cylinders at that end of the block, mounting means for the swash plate in the casing for transmitting to the casing the piston thrusts that act on the swash plate, a valve plate secured within the casing, on which the cylinder block is mounted for rotation, a low and a high pressure main port in the valve plate, a cylinder port from each cylinder opening into the surface of the cylinder block which rotatably engages said valve plate, whereby during rotation, cylinders with outwardly moving pistons are connected to one main port and cylinders with inwardly moving pistons are connected to the other main port, a drive shaft passing through the valve plate to rotate the cylinder block, the casing having a closure member at an end which is opposite the valve plate, a cover of pliant material mounted on one of said closure member and said casing and externally of the casing adjacent to the swash plate and together with said closure member covering said end of the casing which is oppo-

site the valve plate, said cover covering said closure member, and a quantity of air or other gas trapped by the cover against the external surface of the closure member, the natural frequency of vibration of the cover being low compared to the natural frequency of the material used for the casing.

4,037,522

VEHICLE AIR CONDITIONING COMPRESSOR

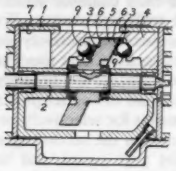
Teruaki Inoshita; Takashi Fukuda; Hitoshi Toga, all of Toyota, and Hikaru Takaoka, Kariya, all of Japan, assignors to Taihou Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

Filed Sept. 23, 1975, Ser. No. 615,888

Claims priority, application Japan, Sept. 24, 1974, 49-109856

Int. Cl.[2] F01B *3/00;* **F04B** *1/12, 27/08*

U.S. Cl. 92—71 **3 Claims**



1. In a vehicle air conditioning compressor having a swash plate mounted on a rotatable shaft and a plurality of pistons, each of which is slidably engaged with the swash plate through intermediary of a set of a ball means and a shoe plate through the intermediary of a set of a ball means and a shoe means rotatably engaging with one another and slidably reciprocates inside a cylinder bore of a common cylinder block in accordance with rotation of the swash plate, an improvement wherein:

each said shoe comprises an imperforate ferrous backing plate as a major part thereof and a continuous, imperforate, sintered porous layer of a copper alloy, which is relatively thin with respect to said major part, formed integrally on said backing plate in slidable contact with said swash plate, said sintered layer having thickness in the range of from 0.3 mm to 0.5 mm and consisting essentially of tin in a range of from 2.5 to 12.1 percent by weight and lead in a range of from 7.0 to 25.0 percent by weight with the balance by weight being copper.

4,037,523

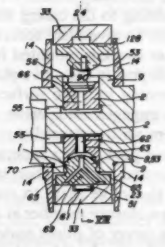
APPLICATION OF AN ENTERING OR DEEP-DIVING PISTON SHOE WITH A CENTRAL RADIAL SUPPORT MEMBER AND MEANS FOR SECURING THE SAME IN FLUID HANDLING RADIAL PISTON DEVICES

Karl Eickmann, 2420 Isshiki, Hayama, Kanagawa, Japan

Filed Nov. 29, 1974, Ser. No. 528,346

Int. Cl.[2] F01B *1/00*

U.S. Cl. 92—72 **16 Claims**



1. A fluid machine comprising: a housing member; a rotor member rotatable in said housing member about a rotor axis and formed with a plurality of angularly spaced and radially outwardly opening recesses and with a radially outwardly opening cylinder at the base of each recess; said cylinders having wall portions extending with equal radii along said cylinders and said recesses, partially forming walls of said recesses; a piston radially displaceable in each of said cylinders and having a piston head with a bearing bed; a plurality of piston shoes radially displaceable independently of their respective pistons, each piston shoe having a radially inwardly projecting portion radially engageable with a respective bearing bed of the respective piston head of a respective piston, said inwardly projecting portion always engaged in the respective recess and partially moveably retained between respective portions of said wall portions and at radially outermost position between wall portions of the respective recess; a pair of end elements carried on one of said members and having radially extending innermost planar faces flaking said shoes axially; said bearing bed and said inwardly projecting portion having complementary face portions of equal radii; a cam in said housing engageable radially with said piston shoes and constructed to displace the same radially; and portions of said shoes being each received in a respective containment space delimited radially by said rotor member and said cam and delimited axially by said innermost faces of said end elements.

4,037,524

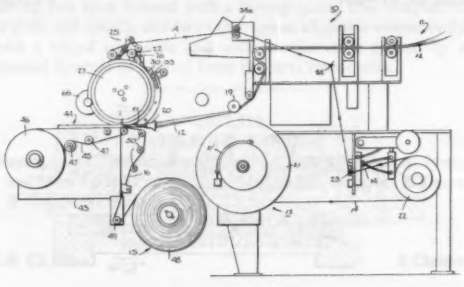
APPARATUS FOR COMBINING A TUBE WITH A CIGARETTE FILTER

Floyd Vanmeda Hall, Durham, N.C., assignor to Liggett Group Inc., Durham, N.C.

Filed Nov. 8, 1976, Ser. No. 740,030

Int. Cl.[2] A24C *5/50*

U.S. Cl. 93—77 FT **17 Claims**



1. A filter making machine comprising

means for supplying a continuous supply of tow to an injection station;

means for supplying spaced apart tubes to said injection station;

means for positively moving each tube into said tow at said injection station; and

means for wrapping paper about said tow and injected tubes downstream of said injection station to form a continuous filter rod with longitudinally spaced apart tubes therein.

4,037,525

SIGNATURE STACKER EMPLOYING SWINGABLE INTERCEPT MEANS DRIVEN IN A NON-LINEAR FASHION

Christer A. Sjogren, Miami, Fla., and Ralph H. Backman, Taby, Sweden, assignors to EDS, Inc., Hialeah Gardens, Fla.

Filed July 30, 1975, Ser. No. 600,491

Int. Cl.[2] B31B *1/98*

U.S. Cl. 93—93 C **26 Claims**

1. A stacker for forming bundles containing a preselected number of signatures from an incoming signature stream deliv-

ered to the stacker with the signatures arranged in overlapping fashion, said stacker comprising

infeed conveyor means for receiving said signature stream;

an outfeed location means;

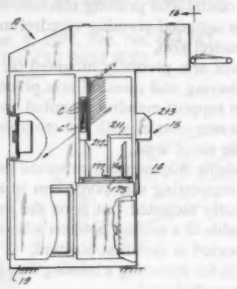
swingable blade means including a blade assembly having tips movable across the downstream end of said infeed conveyor means to intercept said stream;

reciprocating stop means for normally preventing said tips from moving in the path of the signature stream as the signatures leave the infeed conveyor means when said stop means is in an extended position;

preloading means for biasing said blade means in a first direction and against said stop means;

means positioned in said infeed conveyor means for counting said signatures to generate a trigger signal upon reaching a count representative of the desired bundle size;

reciprocating means positioned beneath said blade means for stacking signatures delivered from said conveyor means and blade means to form a bundle when in the collection position and dropping the formed bundle upon said out-



feed location means positioned therebeneath when in the withdrawn position;

drive means responsive to said trigger signal to move said stop means to a withdrawn position displaced away from said blade tips into said stream for temporarily collecting a quantity of signatures on said blade means for a period sufficient to permit the said receiving means to complete its operation;

means for thereafter rapidly rotating said blade assembly from a rest condition through substantially one full revolution and back to said rest condition to deposit the signatures temporarily held thereon to said receiving means and return said blade tips to the position above said stop means and being urged against the stop means by said preloading means in readiness for the next intercept operation;

said rotating means including means for moving said assembly at a faster rate during the intermediate portion of each revolution to move the blades from beneath the signatures deposited thereon so that the signatures undergo free-fall to be deposited upon said reciprocating means.

4,037,526

TRAIN TUNNEL VENTILATION METHOD AND APPARATUS

William M. Jaekle, Moraga, Calif., assignor to Southern Pacific Transportation Company, San Francisco, Calif.

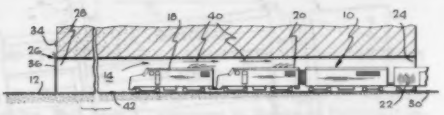
Filed Mar. 10, 1976, Ser. No. 665,425

Int. Cl.[2] E01G *7/02*

U.S. Cl. 98—49 **7 Claims**

1. A method for ventilating a train tunnel that has entrance and exit ends, comprising:

closing said tunnel against the free flow of air from the exit end thereof and maintaining said tunnel closed, while driving said train through said tunnel toward the exit end thereof; and



opening the exit end of said tunnel before said train reaches the exit end of said tunnel.

4,037,527

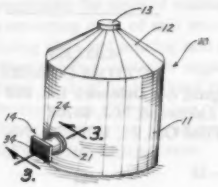
GRAIN DRYING APPARATUS

Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659

Filed Oct. 15, 1975, Ser. No. 622,638

Int. Cl.[2] E04H *7/22*

U.S. Cl. 98—55 **5 Claims**



1. In a grain bin having sidewalls forming a chamber for receiving grain, a plenum chamber for receiving air from an air circulating means and a perforated floor dividing the plenum chamber from the grain receiving chamber for allowing air to flow from the plenum chamber to the grain receiving chamber, the improvement comprising:

an opening in a sidewall of said bin, part of said opening lying above said perforated floor and part of said opening lying below said perforated floor;

a perforated plate disposed between said opening and said grain receiving chamber for preventing grain from flowing out of said opening but allowing the flow of air from said opening directly into said grain receiving chamber; and

means for connecting said air circulating means to said opening for causing air to enter said plenum chamber and said grain receiving chamber through said opening.

4,037,528

DENSITY CONTROL MECHANISM FOR CROP BALER

Allen Andrew White, Peabody; George Yatcilla, and Harold Keith Garrison, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 27, 1976, Ser. No. 718,390

Int. Cl.[2] B30B *9/30*

U.S. Cl. 100—191 **17 Claims**

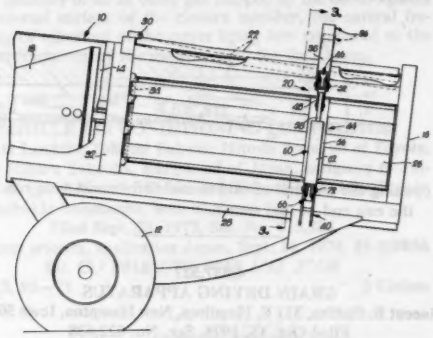
1. In combination with a variable dimension bale chamber having a pair of mutually perpendicular, inwardly and outwardly shiftable walls that coverge toward one corner of the chamber, mechanism for controlling said shifting of the walls including:

a bell crank having a pair of diverging legs provided with outer ends;

structure swingably connecting said crank to one of said walls between said ends;

means for operably coupling the end of one leg with the other of said wall; and

power means coupled with the other leg for rocking the



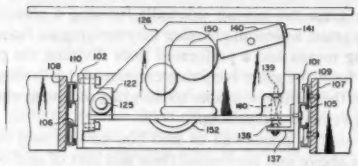
crank and simultaneously displacing the same in a direction to inwardly shift said walls.

4,037,529

BOTTOM CODERS

Patrick Delligatti, c/o Dalemark Ind. 950 Airport Road, Industrial Park, Lakewood, N.J. 08702

Filed Oct. 21, 1975, Ser. No. 624,422
Int. Cl.[2] B41F *17/16*
U.S. Cl. 101—35 **3 Claims**



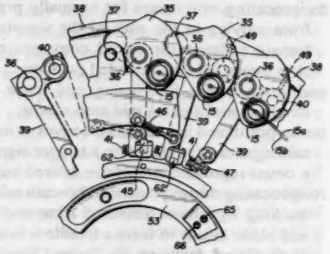
1. In a bottom coder including a cabinet having an upper horizontal product traversing surface, a pair of mutually opposed drive belts for conveying items to be marked across said product traversing surface, and printing means projecting upwardly through the product traversing surface and located in the path of movement of the products whereby the products are engaged by said belts and transported across said surface contact said printing means; the improvement comprising a drawer structure slideably mounted in said cabinet below said product traversing surface; said printing means being mounted within and supported by said drawer structure; means carried by said drawer structure for raising and lowering said printing means whereby said printing means may be moved to a position below the product traversing surface to enable said drawer to be slid open to a position wherein the printing means is completely external of the cabinet to permit complete access to said printing means, and thereafter said drawer may be closed and said printing means may be raised to a position above the product traversing surface whereby it may contact the products being conveyed thereacross; said means for raising and lowering comprising a frame of generally rectangular form; yoke means mounted on said frame for pivotal movement, said yoke means comprising one arm including means supporting the components of said printing means, said yoke means further comprising another arm in contact with an adjustment means whereby said yoke may be pivotally swung between said upper and lower positions and may be adjusted in its upper position to affect pressure of the printing means against the bottom of the items to be marked.

4,037,530

MANDREL TRIP MECHANISM FOR CAN PRINTERS

Enn Sirvet, Washington Township, Bergen County, N.J., assignor to Coors Container Company, Golden, Colo.

Filed Dec. 1, 1975, Ser. No. 636,402
Int. Cl.[2] B41F *17/22*
U.S. Cl. 101—40 **10 Claims**



1. In a continuous printing machine for cylindrical containers, a cam actuated pivoting mandrel mechanism comprising:

a. a mandrel arm,

b. a pivot arm pivotally mounted on said printing machine and having said mandrel arm pivotally mounted thereon,

c. a can support mandrel mounted on said mandrel arm at a point non-coaxial with the mounting of the mandrel arm on the pivot arm,

d. a slidable stop member mounted on the printing machine and supporting said pivot arm in a first position when a properly mounted can is on the mandrel, the stop being movable to a second position wherein the pivot arm is not supported in said first position,

e. means for detecting a missing or a partially loaded can on the mandrel, and

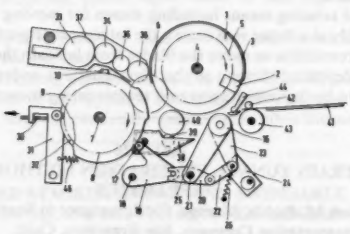
f. means for moving said slidable stop member to said second position in response to said detecting means when a missing or improperly loaded can is on the mandrel, the slidable stop member allowing the pivot arm to move from said first position and in turn move said mandrel arm and mandrel from printing position.

4,037,531

ROTARY PRINTING MACHINE

Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

Filed Aug. 4, 1975, Ser. No. 601,933
Claims priority, application Germany, Aug. 8, 1974, 2438420
Int. Cl.[2] B41L *47/46*
U.S. Cl. 101—91 **4 Claims**



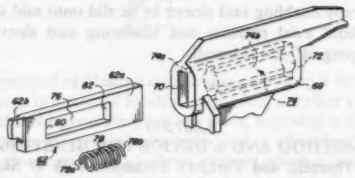
1. A printing machine of the type comprised of a cyclically moving printing member having a printing surface comprised of a rotating printing drum carrying a printing and inking means for inking the printing surface, comprising, in combination, a counterpressure member mounted for movement into an operative position in which it presses towards the inked print-

ing surface so as to press an item to be printed against the inked printing surface; feeding means for feeding an item to be printed into the space intermediate the printing surface and said counterpressure member; moving means operative when driven for moving said counterpressure member into said operative position; controllable coupling means; rotary synchronizing means coupleable with the cyclically moving printing member by said controllable coupling means so as to receive rotational drive force from the printing member and be rotated by the latter and operative when so coupled and rotated for effecting transfer to items to be printed of predetermined portions of the ink image on the printing surface by transmitting mechanical drive force from said printing member to said moving means; and control means operative for detecting feeding of an item to be printed and in response to such detection engaging said controllable coupling means and accordingly establishing a driving connection between the cyclically moving printing member and said synchronizing means.

4,037,532
HAMMER ASSEMBLY

Mario G. Plaza, Fremont, and Michael C. Weisberg, San Carlos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,797
Int. Cl.[2] B41J *9/02*
U.S. Cl. 101—93.48 **5 Claims**



1. A hammer assembly comprising:

a housing having opposing ends and an internal passage extending between said open ends, said passage including a forward portion adjacent the other end of said housing and a rearward portion adjacent the other end of said housing, said forward and rearward portions each being substantially uniform in cross-sectional area along the longitudinal axis of said housing, said cross-sectional area of the forward portion being less than said cross-sectional area of the rearward portion;

a hammer element positioned in said housing for reciprocal movement in said passage between forward and rearward positions, said hammer element having an opening formed therein;

a biasing member positioned in said opening and capable when enabled of biasing said hammer element in the direction of its rearward position, said biasing member comprising a helically wound spring compressed when not enabled between a pair of opposing walls of said hammer element defining the forward and rearward ends of said opening, said spring having a diameter greater than said cross-sectional area of the forward portion of said passage and less than said cross-sectional area of the rearward portion of said passage; and

means for enabling said spring when said hammer element is in at least its forward position, said means for enabling comprising wall means forming part of said housing and being located substantially at the boundary of the forward and rearward portions of said passage for engaging one end of said spring and preventing its movement toward the end of said housing adjacent the forward portion of said passage whereby continued forward movement of said hammer element causes said spring to be further compressed between said wall means at said one end of said spring and one of said pair of opposing walls at the other end of said spring thereby biasing said hammer element in a rearward direction.

4,037,533
COLOR LITHOGRAPHY USING A RANDOM PATTERN SCREEN

Sidney L. Rapoport, Lagrangeville, and Douglas F. Mitchell, Brooklyn, both of N.Y., assignors to Rapoport Printing Corporation, New York, N.Y.

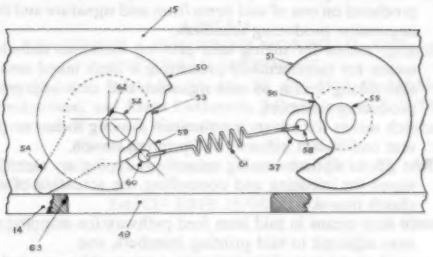
Continuation-in-part of Ser. No. 529,614, Dec. 5, 1974, abandoned. This application June 2, 1976, Ser. No. 692,206
Int. Cl.[2] B41M *1/14*
U.S. Cl. 101—211 **10 Claims**

1. In the method of reproducing multicolored visual subject matter having gradations of tonal density, including the steps of making a continuous tone color separation for at least each of the colors cyan, magenta and yellow, producing a halftone image from each of said color separations, converting each of said halftone images to a halftone printing plate, and printing a substrate with each of said halftone printing plates in registry, the improvement comprising the steps of making at least two secondary images, converting each of said secondary images into a secondary printing plate and printing said substrate with each of said secondary printing plates in registry with said halftone printing plates, each of said at least two secondary images being made by exposing a different one of said magenta, cyan and yellow color separations to a photographically sensitive surface through a random pattern screen.

4,037,534
IMPRINTER

William P. Barbour, 791 E. Fairview Ave., Annapolis, Md. 21403

Filed Oct. 29, 1975, Ser. No. 626,999
Int. Cl.[2] B41F *3/04*
U.S. Cl. 101—269 **6 Claims**

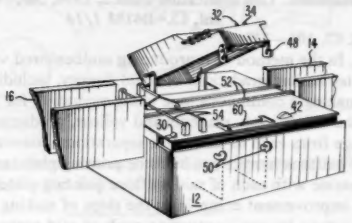


1. An imprinter for printing data on a document, comprising a base having guidance means; a carriage assembly movable along said guidance means during an imprint stroke and a return stroke; and means cooperating with said carriage assembly and said guidance means for lowering said carriage assembly during the imprint stroke and raising said carriage assembly during the return stroke, wherein said lowering and raising means includes front wheel means engageable at said guidance means and rotatably mounted about a rotatable lifting cam, a front axle eccentrically mounted with respect to said lifting cam and operatively connected with said carriage assembly, a lifting cam lever rotatable in unison with said lifting cam, slot means axially spaced along said guidance means for cooperating with said lifting cam lever at the beginning of the imprint stroke to lower said carriage assembly and at the beginning of the return stroke to raise said carriage assembly, and biasing means for biasing said lifting cam lever into said slot means at the termination of the imprint stroke.

4,037,535
HIGH SPEED PRINTING APPARATUS

Jerry Hans Lehmann, Rochester; Richard L. Mills, Pittsford; William H. Mowry, Jr., Ionia; James D. Peglow, Canandaigua; Norman H. Preston, Rochester, and Aniel G. Sitole, Pittsford, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 499,560, Aug. 22, 1974, abandoned.
This application Dec. 12, 1975, Ser. No. 640,194
Int. Cl.[2] B41F *1/28, 1/34*
U.S. Cl. 101—287 **5 Claims**



1. Printing apparatus for printing signatures and dates on items effective to commercially validate such items comprising:

a printing station having a printing platen and including demountable printing members capable upon introduction of an item in juxtaposition to said platen of producing an impression of a signature and a date thereon from said printing members,

input feed means for feeding items such as checks to said printing station,

output collecting means for collecting items after printing,

an item feed pathway including continuously movable means for moving items from said input feed means to said printing station and thence to said output collecting means,

means in said printing station for causing an impression to be produced on one of said items from said signature and date impression producing members,

linking means for inking said printing members including means for incrementally presenting a fresh inked area of said inking means to said signature and date impression producing members,

clutch means for advancing the item moving means to present one of said items to said printing station,

first photo optical sensing means producing an electrical signal for initiating and controlling the actuation of said clutch means,

item stop means in said item feed pathway for stopping the item adjacent to said printing members, and

second photo optical sensing means removably mounted on said item stop means,

including means demountably supporting the second photo optical sensing means permitting the latter to be removed or replaced as required.

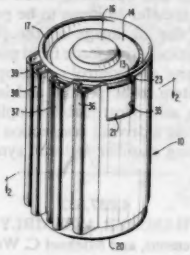
4,037,536
ENCLOSURE FOR EXPLOSIVE MATERIAL

George L. Griffith, Coopersburg, Pa., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Sept. 8, 1975, Ser. No. 611,593
Int. Cl.[2] F42B *3/00*
U.S. Cl. 102—20 **1 Claim**

1. An improved enclosure for explosive material of the type having a cylindrical container including an enclosed lower end, a sidewall sealingly secured to said lower end, a cover adapted to be sealingly secured to said sidewall with a seam to form an enclosed, sealed container, and a sleeve in encircling engagement with the container extending substantially the entire length of said sidewall, said sleeve and said sidewall including means cooperating to define at least one recess adapted to receive a detonator, and maintain said detonator in contact with said sidewall along substantially the entire length of said sidewall, wherein the improvement comprises:

a depression in the upper end of said sidewall below the seam of said sidewall with said cover, extending around the circumference of said sidewall, with said seam constituting the upper boundary of said depression; and a resilient

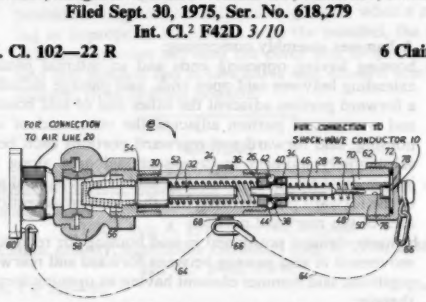


protrusion of the inner surface of said sleeve at the upper end of said sleeve, having a shape corresponding to that of said sidewall depression, and extending at least partially around the circumference of the inner surface of said sleeve, said protrusion engaging said sidewall depression, thereby enabling said sleeve to be slid onto said sidewall without axial rotation and hindering said sleeve from slipping off said sidewall.

4,037,537
METHOD AND A DEVICE FOR BLASTING

Torgny Thorsell, and Torbjorn Svensson, both of Skelleftea, Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 30, 1975, Ser. No. 618,279
Int. Cl.[2] F42D *3/10*
U.S. Cl. 102—22 R **6 Claims**



1. A device for initiating the explosion of an explosive blasting charge by means of a shock wave transmitted to the charge by means of a shock wave conductor,

said device comprising a pressurized fluid operated initiator for detonating a blasting cap to produce the shock wave,

said device further comprising a pressurized fluid operated operating element movable from a rest position to an operating position in response to pressurized fluid,

a connection means for connecting said operating element through a pressurized fluid line to a remote source of pressurized fluid for operator initiator of the operation of said device,

said operating element being operable in said operating position for initiating movement of a striking element against the blasting cap for detonating the same,

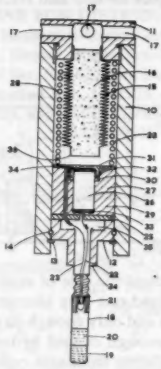
and means for connecting said device to a shock wave conductor for conducting the shock wave from the blasting cap to a remotely positioned explosive blasting charge for detonation thereof.

4,037,538

DEVICE FOR FIRING AN ELECTRIC DETONATOR

Jeremy Charles Andrews, Salcoats, and Gordon Brian Roger Shannon, Dundonald, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 515,017, Oct. 15, 1974, Pat. No. 3,987,729.
This application Aug. 26, 1976, Ser. No. 718,203
Claims priority, application United Kingdom, Oct. 31, 1973, 50605/73
Int. Cl.[2] F42D *1/04*
U.S. Cl. 102—23 4 Claims



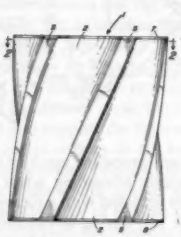
1. A method of blasting comprising providing a first explosive charge in a desired location, exploding a further explosive charge thereby generating a shock wave, exposing to the shock wave a piezo-electric transducer located in a housing having a wall portion formed by a bellows element which is deformable in response to external pressure on the housing, the bellows transmitting pressure to the transducer, said transducer being capable of generating an electrical voltage in response to the shock wave, and conducting said voltage to an electric detonator having a fusehead capable of being activated by the voltage so as to fire said detonator, said first explosive charge being associated with said detonator so as to be exploded by the exploding of said detonator.

4,037,539

SPIRAL CHANNEL BLAST-FRAGMENT WARHEAD

Emory E. Hackman, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 20, 1971, Ser. No. 168,509
Int. Cl.[2] F42B *13/48*
U.S. Cl. 102—67 9 Claims



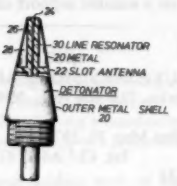
1. A warhead comprising:
a solid, one-piece, substantially cylindrical casing;
coverplates on the ends of of said casing;
an explosive material substantially filling said casing and extending to the inner periphery of said casing;
plural detonators symmetrically disposed along the longitudinal axis of said casing within said explosive material; and
spiral channel means having a concave circular-arc-shaped cross-section formed in said casing for producing a particular fragmentation pattern.

4,037,540

DIRECTIONAL ANTENNA FOR A PROJECTILE OR ROCKET DETONATOR

Wolfgang Keydel, Ulm (Danube), Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Nov. 11, 1975, Ser. No. 630,893
Claims priority, application Germany, Nov. 16, 1975, 2454528
Int. Cl.[2] F42C *13/04, 13/00;* H01Q *13/10, 13/18*
U.S. Cl. 102—70.2 P 17 Claims



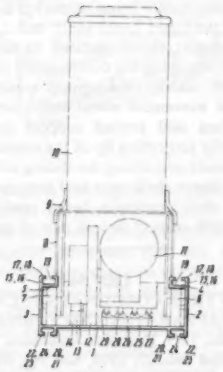
1. In a projectile or rocket having a metal outer shell and including a proximity or influence detonator operating with electromagnetic waves, particularly according to the reflected beam principle, and a directional antenna having a rotationally symmetrical radiation diagram for said detonator, the improvement wherein said antenna is constituted by a circular slot which is formed in said outer shell and which is coaxial with the longitudinal axis of the said projectile or rocket; and further comprising resonator means disposed within said outer shell, and coupled between said antenna and said detonator for exciting said circular slot.

4,037,541

TRACK FOR A COMBINED MONORAIL AND OVERHEAD MONORAIL

Horst Giessler, Salzboden Strasse 22, CH-4310 Rheinfelden, Switzerland, and Klaus Luckerath, 2 Prattelnerstr. 8, D-7889 Grenzach-Wyhlen 2, Germany

Filed Oct. 16, 1975, Ser. No. 623,202
Claims priority, application Germany, Oct. 17, 1974, 7434754[U]
Int. Cl.[2] E01B *25/08, 25/22*
U.S. Cl. 104—109 6 Claims



1. A track for a combined monorail and overhead monorail

for slidably supporting an accessory device having a power supply control tracks and at least a pair of roller members comprising:

a U-shaped rail section including a base wall and two sidewalls secured to the ends of said base wall and extending upwardly therefrom, each of said sidewalls having a flange extending inwardly from its upper edge which cooperates with said base wall to slidably receive therebetween the roller members of the accessory device; and

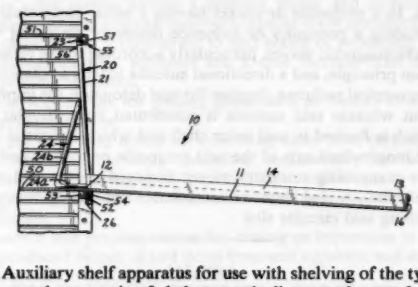
at least one shoulder section extending along the length of said rail section formed on the lower surface of the bottom wall of said rail section as well as on the upper surface of one of the flanges of said sidewalls, said shoulder section having two arms extending generally outwardly therefrom, the ends of which extend toward one another, to define therebetween an outwardly opened, longitudinally disposed channel extending therethrough, for mounting the track on a suitable support or suspension system.

4,037,542

AUXILIARY SHELF APPARATUS

Thomas Kropiwka, 715 4th Ave., NW., New Brighton, Minn. 55112

Filed May 20, 1976, Ser. No. 688,362
Int. Cl.[2] A47B *41/04*
U.S. Cl. 108—32 **7 Claims**



1. Auxiliary shelf apparatus for use with shelving of the type having at least a pair of shelves vertically spaced apart from one another in rack-type arrangement, wherein the upper shelf of said pair has formed at its front edge a downwardly projecting lip, said apparatus comprising:

a. tray means having front and rear ends;

b. first support means secured at said rear end of said tray means for detachably engaging the lower shelf of said pair thereby supporting said tray means against vertical downward movement and horizontal movement toward said lower shelf when said first support means engages said shelf, said tray means being supported in substantially flush alignment with said lower shelf; and

c. second support means secured to said tray means for detachably engaging the downwardly projecting lip of the upper shelf, said second support means resisting pivotal downward movement about said rear end of said tray means when said second support means engages the downwardly projecting lip of the upper shelf, said second support means permitting the sliding movement of an item from said lower shelf onto said tray means,

said auxiliary shelf apparatus being readily attachable and detachable with respect to said pair of shelves.

4,037,543

POLLUTION FREE COMBINATION CARBONIZATION APPARATUS AND FURNACE

James F. Angelo, P.O. Box 846, Jonesboro, Ark. 72401

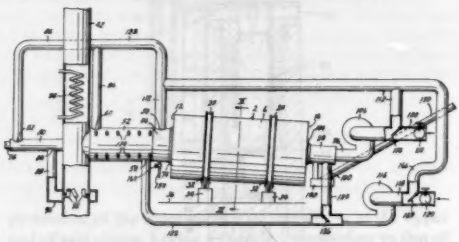
Filed Feb. 27, 1976, Ser. No. 662,216
Int. Cl.[2] F23G *5/06*; C10B *1/10*
U.S. Cl. 110—14 **22 Claims**

1. A combination device for converting granular cellulosic material alternatively either to charcoal or to ash, said device comprising:

a. a retort including means by which said cellulosic material is continuously introduced thereto, and by which the charcoal or ash in continuously removed therefrom after conversion of said material,

b. means operable initially to start the conversion reaction by heating at least a portion of the introduced material to carbonization temperature to initiate a spontaneous, self-sustaining carbonization reaction in which a combustible hydrocarbon gas is released from said material,

c. means operable to inject air into said retort, and



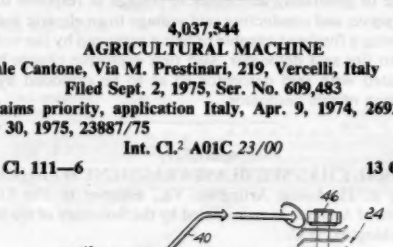
d. means operably to adjust the rate of injection of air into said retort, whereby said rate may alternatively either be set sufficiently low to add only enough oxygen to support combustion of only enough of said hydrocarbon gas, in spatially separated relation from said cellulosic material, to provide sufficient heat to dry and elevate the freshly added material to carbonization temperature, whereby a continuous carbonization reaction producing charcoal is established independently of said initial heating means, or sufficiently high to add sufficient oxygen to permit relatively complete combustion of said hydrocarbon gas and said material, whereby a continuous ash producing operation is established.

4,037,544

AGRICULTURAL MACHINE

Natale Cantone, Via M. Prestinari, 219, Vercelli, Italy

Filed Sept. 2, 1975, Ser. No. 609,483
Claims priority, application Italy, Apr. 9, 1974, 26927/74; May 30, 1975, 23887/75
Int. Cl.[2] A01C *23/00*
U.S. Cl. 111—6 **13 Claims**



1. An agricultural self-propelled machine including a vehicle capable of autonomously advancing when driven and an assembly of implements actuated with a rotary motion and capable of processing the soil during advancement of the vehicle thereon comprising: a primary source of mechanical energy, at least two transducers having inputs connected to said primary source and individually capable of transforming the mechanical energy produced thereby into independent non-mechanical energy flows and having outputs connected to separate power flow channels, and at least two driving means fed through channels with the non-mechanical energy flows produced by

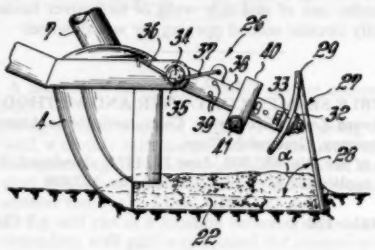
said transducers, at least one of said driving means being operatively connected to means to advance said vehicle on the soil, and at least another of said driving means being operatively connected to said assembly of implements, and wherein at least one of the driving means is provided with means to vary the power supplied thereby, and the speed imparted thereby to the members to which it is operatively connected, and also with means to vary the former without proportionately varying, or without varying at all, the latter.

4,037,545

MACHINE FOR DISTRIBUTING MATERIAL

Heinz Dreyer, Hasbergen-Gaste, Germany, assignor to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Germany

Continuation of Ser. No. 422,040, Dec. 5, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,972
Claims priority, application Germany, Dec. 16, 1972, 2261765
Int. Cl.[2] A01C *5/06*
U.S. Cl. 111—85 **6 Claims**



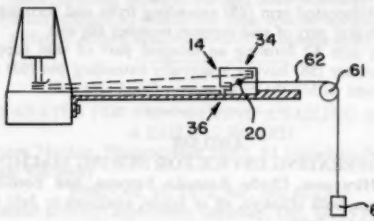
1. Machine for distributing granular or powdered material and suitable for being pulled by a tractor, comprising a frame, a hopper mounted on the frame, furrow openers mounted on the frame, material conveying tubes connected to the furrow openers and the hopper for the transport of material from the hopper to the furrow openers, the furrow openers having outlet orifices for delivery of said material to the soil, furrow closers connected to the furrow openers for pivoting in vertically extending planes with respect to and behind the furrow openers, each furrow closer comprising a support pivotally connected to the furrow opener and a hiller mounted on the support by a mounting device for projection of the hiller below the mounting device and into the soil for closing of a furrow, the hiller being secured to the mounting device by a releasable fastener so that the length of the projection of the hiller below the mounting device can be adjusted, the furrow openers being movable between a lower position and an upper-position with resultant movement of the furrow closers to, respectively, penetrate the ground and raise from the ground, the pivot mounting of the furrow closers and the length of the supports, and the adjustability of the adjustable mounting of the hillers on the mounting devices being such that the hillers can be disposed on the supports so that in the raised position the hillers are disposed beneath the furrow openers so that when the furrow openers and furrow closers are lowered, the hillers contact the ground and support the furrow openers above the ground so that the outlet orifices do not become plugged with soil, and while in the working position the hillers are the only parts of the furrow doses which contact the ground the hiller being formed of a single piece of flexible spring steel strip and consisting essentially of two downwardly projecting fingers, a U-shaped section, and sections joining the free ends of the U-shaped section to the upper ends of the fingers, said U-shaped section being arched to provide the U-shaped section concave when viewed from the forward end of the machine, the hiller being clamped on the mounting device at the arched portion.

4,037,546

SEWING MACHINE APPARATUS FOR ALIGNING AND SEWING PIECES OF TEXTILE FABRIC OR THE LIKE

Johann Otto Kleinschmidt, Karlsruhe, Germany, assignor to Union Special G.m.b.H., Stuttgart, Germany

Filed July 27, 1976, Ser. No. 709,051
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.26 **19 Claims**



1. In combination, a sewing machine having differential feed means for engaging and feeding a overlying series of fabric panels and an apparatus for aligning a mismatched trailing end portion means of said fabric panels in a predetermined position comprising:

means for accepting and holding each of said end portion means of said fabric panels and movable therewith;

means for continuously sensing the position of each of said end portion means relative each other during the sewing operation; and

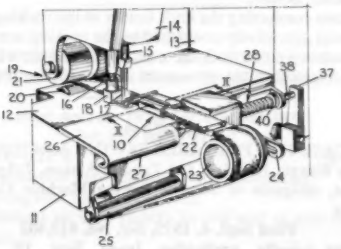
means connected to said sensing means for selectively advancing or retarding the relative rate of feed of said differential feed means thereby aligning each of said end portion means upon completion of the sewing operation.

4,037,547

CLAMSHELL GUIDE TO APPLY ANNULAR ELASTIC BANDS ON CLOTHES

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Dec. 17, 1974, Ser. No. 533,501
Claims priority, application Italy, Dec. 27, 1973, 32289/73
Int. Cl.[2] D05B *23/00, 35/06*
U.S. Cl. 112—121.27 **1 Claim**



1. An openable guide for guiding circular elastic bands to the sewing instrumentalities of a sewing machine for attachment as waist bands onto garments, said guide comprising:

a. individual support members **(58, 60)** independently mounted for pivotal movement on the sewing machine;

b. a pair of opposed elements **(29, 30)** attached to said support members **(58, 60)** respectively having cooperating internal surfaces defining a shaped channel **(31)** through which the elastic bands are guided;

c. control means **(28)** operatively connected to a first one said support members **(58)** for selectively pivoting the latter between positions of close proximity with and a

lower inclined location spaced from the others of said support members (60); and

d. means (62, 63, 64) interconnecting said first one of said support members (58) with the other of said support members (60) for effecting simultaneous pivotal movement of the latter with and in a direction opposite to said first support member (58) during selective actuation of said control means (28);

e. said means for effecting simultaneous pivotal movement of said support member 60 including:

1. a bifurcated arm (65) extending from and forming an integral part of said support member 60; and

2. an arm 62 forming an integral part of said support member (58) having a laterally extending pin (63) disposed within the bifurcation of said arm (65).

4,037,548

KNIFE OPERATING DEVICE FOR SEWING MACHINES

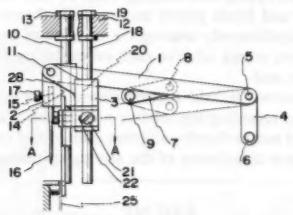
Tetsuro Hirayama, Chofu; Kousuke Yuyama, and Yoshihiko Matsuura, both ofTokyo, all of Japan, assignors to Juki Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1974, Ser. No. 519,243

Claims priority, application Japan, Nov. 1, 1973, 48-123222; Nov. 8, 1973, 48-125748; Nov. 8, 1973, 48-125749

Int. Cl.[2] D05B *37/00*

U.S. Cl. 112—123 R 14 Claims



1. A knife operating device for a sewing machine, comprising:

a. a rocking arm having a front end and a rear end, and being pivotally mounted at its rear end to the sewing machine,

b. a needle stub guiding bar intersecting the rocking arm at the front end of the rocking arm, the bar being connected to the frame of the sewing machine,

c. a needle stub mounted on the needle stub guiding bar and being guided thereby,

d. a knife holder,

e. means connecting the knife holder to the rocking arm, and

f. means operatively connected to the rocking arm to simultaneously move both the needle stub and the knife holder in response to the movement of the rocking arm.

4,037,549

CASE FOR PORTABLE SEWING MACHINES

Susumu Hanyu, Hachioji, and Takashi Amano, Tokyo, both of Japan, assignors to Janome Sewing Machine Co., Tokyo, Japan

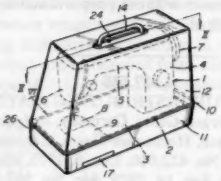
Filed Sept. 4, 1975, Ser. No. 610,403

Claims priority, application Japan, Sept. 10, 1974, 49-108150[U]

Int. Cl.[2] D05B *73/10*

U.S. Cl. 112—258 7 Claims

1. A case for a portable sewing machine of the type having a work supporting rectangular bed, parts mounted on and extending above said bed and including a standard secured to the bed, a bracket secured to the standard and spaced apart from the bed and a flywheel mounted on said standard adjacent to said bracket, and a handle mounted on top of the bracket, said case comprising a hollow rectangular base having a bottom wall, four side walls extending upwardly from said bottom wall and an open top and being arranged to receive the bed of a sewing machine; means for securing said base to the bed therein; and a cover at least partially surrounding the parts of a machine whose bed is supported by said base, said cover being open from below and having a top wall and four side walls extending downwardly from said top wall, said cover having an elongated opening provided in said top wall through



which the handle of the machine whose bed is supported by said base extends so that the case can be lifted through the medium of the machine therein by lifting the machine by way of the handle, one of said side walls of said cover having a substantially circular second opening for said flywheel.

4,037,550

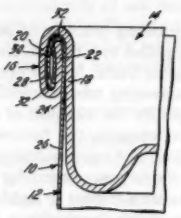
DOUBLE SEAMED CONTAINER AND METHOD

David Edward Zofko, Greenwich, Conn., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 483,800, June 27, 1974, abandoned. This application May 18, 1976, Ser. No. 687,496

Int. Cl.[2] B21D *51/32, 51/34*

U.S. Cl. 113—120 Y 7 Claims



1. A method of hermetically double seaming a flanged metallic container end closure to an open-ended metallic cylindrical container body whose body wall metal is highly worked, has a substantially axial grain direction and is less than about 0.0057 inch thick at its marginal open end portion, to form a container capable of withstanding internal pressures of up to about 90 psi developed at elevated temperatures of up to about 140° F., which comprises:

forming an annular body curl of the less than about 0.0057 inch thick marginal open end portion of the container body wall, said curl having an edge which points toward the container body wall,

placing a flanged metallic end closure over the curled open end of the container body,

applying a sealant material to a surface of at least one of the end closure and body wall for bonding said closure and said wall together, and,

double seaming the end closure to the container body by bending the end closure flange downward and up under the body curl between it and the container body, in a first operation, to form an end closure skirt and cover hook, and by radially compressing the seam, in a second operation, to bend the body curl and conform it to substantially the shape of the end closure skirt and cover hook, so that the compressed closure skirt and cover hook are coextensive with said body curl and terminate in adjacent edge

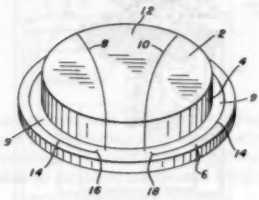
portions presented axially toward the open end portion of the container body wall, tightening and bonding the seam against the container body, hermetically to double seam the end closure to the container body.

4,037,551

TEAR-OFF CLOSURE AND METHOD OF FORMING THE SAME

Paul R. Lewis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,255
Int. Cl.² B21D *51/44*
U.S. Cl. 113—121 C **4 Claims**



1. A method of forming a tear-off closure comprising the steps of:

drawing a metal disc into a closure shell having a top end wall, a closure skirt around the top end wall, an annular rim extending outwardly from the bottom of the closure skirt and a wall depending from the outer edge of the annular rim;

severing said rim at a location between said skirt and said depending wall part way around the closure to leave an outwardly projecting edge at the bottom of the closure skirt;

curling a bottom edge of said depending wall inwardly under said outwardly projecting edge on the closure skirt; and

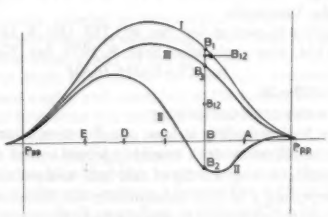
curling the top edge of said depending wall inwardly over said outwardly projecting edge to form a beaded pull ring with an inwardly open slot therein in which at least a portion of said outwardly projecting edge of the closure skirt is entrapped.

4,037,552

PROCESS FOR REDUCING THE STRESSES CAUSED BY THE VERTICAL BENDING OF A BOAT ON INDEPENDENT TANKS INSTALLED THEREIN

Jaime Torroja, Las Arenas, Spain, assignor to Sener, Tecnica Industrial Y Naval S.A., Las Arenas, Spain

Continuation of Ser. No. 527,591, Nov. 27, 1974, abandoned. This application May 24, 1976, Ser. No. 689,657
Claims priority, application Spain, Dec. 1, 1973, 421085
Int. Cl.² B63B *25/08*
U.S. Cl. 114—74 R **5 Claims**



1. A process for reducing the stresses in a vessel comprising the steps of,

providing a hull having a plurality of zones in each of which an independent cargo tank for the storage of material, such as liquefied gas, is to be installed,

subjecting the hull in each of said zones along a central transverse section with respect to the tank to be installed therein to a predetermined vertical static bending moment in the absence of the tank by adjusting the ballasting of the hull while it is afloat,

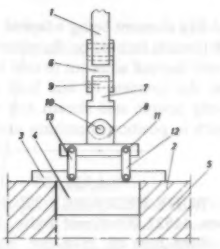
and installing each of the tanks in said hull within its respective zone while maintaining said predetermined vertical static bending moment on said zone whereby the maximum stresses to which the tank will be subjected under different sailing conditions will be substantially reduced.

4,037,553

APPARATUS FOR CONNECTING A SAILING MAST TO A SAILING BOARD

Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Germany

Filed Oct. 15, 1975, Ser. No. 622,512
Claims priority, application Germany, Oct. 18, 1974, 2449636
Int. Cl.² B63B *15/00*
U.S. Cl. 114—91 **5 Claims**



1. Apparatus for connecting a sailing mast to a sailing board having a longitudinal dimension comprising a linking member, means for pivotably attaching said linking member to the foot of a mast, connecting means for connecting said linking member to a sailing board, said connecting means comprising means for moving said linking member in a plane along the longitudinal dimension of the sailing board so that the mast can be lifted, fixed and firmly maintained in at least two positions along the longitudinal dimension of the sailing board.

4,037,554

COMBINATION GAFF AND BOAT HOOK

Peter F. Foscolo, 4565 Middlesex Road, Wilmington, N.C. 28401

Filed Apr. 29, 1976, Ser. No. 681,387
Int. Cl.² B63B *21/54*
U.S. Cl. 114—221 R **4 Claims**

1. A combination gaff and boat hook comprising:

a rigid elongated rod-like element;

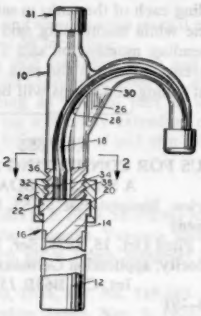
a gaff element secured fixedly to one end of said rod-like element;

a sheath for said gaff element adapted to be removably positioned thereover and to be connected adjacent one end thereof to said rod-like element to form an extension thereof, said sheath being shaped to present a boat hook at the other end thereof;

a slit formed in the side wall of said sheath element adapted to permit the passage of said gaff therethrough during sheathing and unsheathing therof, said sheath providing the housing for and defining therein an arcuate through bore dimensioned and configured to receive said gaff element therein;

and a lock nut for removably positioning said sheath over said gaff and for coupling said sheath to said rod-like

element, an interior recess being formed in said nut configured and dimensioned to rotatably receive a peripherally extending enlarged head on one end of said rod-like element, the longitudinal axis of said lock nut being coaxial to the longitudinal axis of said rod-like element, and an interior portion of said lock nut remote from said one end of



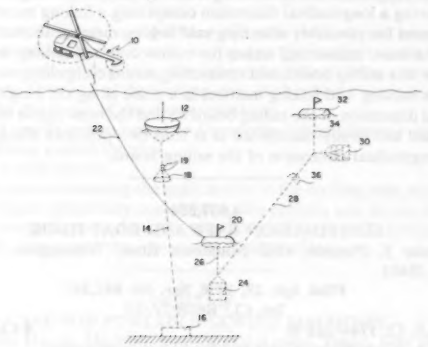
said rod-like element being adapted to threadedly cooperate with threads formed on the outer surface of said sheath on the end thereof adjacent to said one end of the rod-like element, the rotation of said lock nut being adapted to selectively couple said sheath and rod-like element with the sheath in position sheathing said gaff element.

4,037,555

BUOY RECOVERY TECHNIQUE

Myer Berman, 14527 Woodcrest Drive, Rockville, Md. 20853

Filed June 30, 1976, Ser. No. 701,487
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—245 **3 Claims**



1. Apparatus for recovery of moored buoys having a buoy mooring line in a fluid medium from a moving vehicle comprising:

a first float;

a depressor connected to said first float;

a second float;

a diverter connected to said second float;

a sweep wire connected between said depressor and said diverter to sweep through the fluid medium in a sweep area defined by said diverter;

a grapnel attached to said sweep wire for engaging a buoy mooring line to which the buoy to be recovered is attached; and

a grapnel receiving ring attached to said buoy mooring line between a pair of wedge stops for engaging said grapnel;

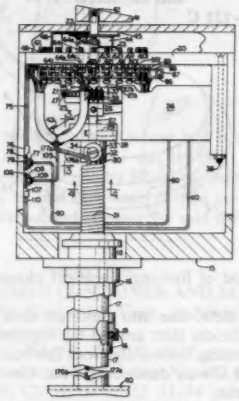
whereby when said apparatus is towed from said moving vehicle said grapnel engages said buoy mooring line enabling recovery of said buoy.

4,037,556

BOAT STEERING MECHANISM FOR OUTBOARD MOTOR

Garrett H. Harris, 157 S. Denver, Jackson, Miss. 39209, and Louis M. Harris, 2423 W. Mulberry, San Antonio, Tex. 78228

Filed Oct. 28, 1975, Ser. No. 626,305
Int. Cl.[2] B63H *25/42, 21/26*
U.S. Cl. 115—18 R **21 Claims**



1. Steering mechanism for a boat motor having a shaft which turns to turn the boat motor which comprises a steering motor connected to turn the shaft, a plurality of first contacts spaced circumferentially around the shaft, a sweep contact mounted on the shaft and sequentially engageable with the first contacts as the shaft turns, a pedal, means for pivotally mounting the pedal, a contact plate means, means for causing the contact plate means to move with the pedal, a plurality of second contacts engageable with the contact plate means, means connecting each first contact with a respective one of the second contacts, and power means connected to drive the steering motor when steering motor operating power from the power means flows through the sweep contact while said sweep contact engages one of the first contacts which is connected to a second contact in engagement with the contact plate means, the flow of steering motor operating power through the sweep contact and the steering motor stopping when the sweep contact reaches a first contact connected with a second contact that is free of the contact plate means.

4,037,557

HAND-DRIVEN WATER CRAFT

Luis Jorge Velandia Arevalo, Torres Los Andes, Apt. No. 6, Merida, Venezuela

Continuation-in-part of Ser. No. 403,713, Oct. 4, 1973, Pat. No. 3,903,834. This application Sept. 8, 1975, Ser. No. 611,429
Int. Cl.[2] B63H *16/04*
U.S. Cl. 115—24 **6 Claims**

1. A water craft comprising:

a front hull including at least one flotation chamber;

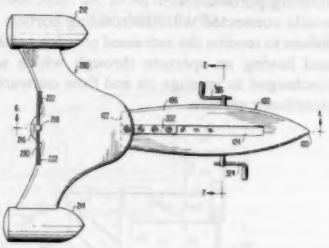
a rear stabilization deck assembly joined to and extending as a cantilever rearwardly of said hull, said stabilization deck comprising a hollow substantially flat flotation chamber;

foot controlled rudder means pivotally mounted on said rear deck assembly; and

propulsion means on said hull and including a frame, a hand crank transversely mounted on said frame, a propeller assembly mounted on said frame, and means on said frame

coupling rotary movement of said crank to said propeller assembly,

said hull, said rear deck assembly, and said propulsion means each comprising discrete disconnectable modules; said



rear stabilization deck including an elongated tongue; and said front hull including an elongated channel, said tongue being received in said channel and being longitudinally adjustable to establish the overall length of the craft.

4,037,558

MARINE DRIVE UNITS

Clarence Frank Nossiter, Shorwell, England, assignor to Enfield Industrial Engines Limited, Cowes, England

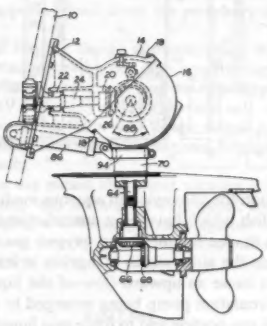
Division of Ser. No. 270,512, July 10, 1972, Pat. No. 3,826,219. This application Mar. 26, 1974, Ser. No. 454,961

Claims priority, application United Kingdom, July 9, 1971, 32311/71; Nov. 6, 1971, 51646/71

The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.

Int. Cl.[2] B63H *5/12*

U.S. Cl. 115—41 HT **1 Claim**



1. In a marine drive unit for transmitting drive between an inboard engine of a vessel and a propeller thereof, which comprises:-

a first casing adapted to be mounted on the transom of the vessel and rotatably mounting a horizontal lay shaft which extends transversely of the fore-and-aft axis of the vessel;

an input shaft adapted to be drivingly connected to the inboard engine and extending in the fore-and-aft direction;

a pair of first drive transmitting elements mounted rotatably, and in spaced relation, on said lay shaft and in constant mesh with a driving element carried by the input shaft so as to contra-rotate with respect to one another;

a second drive transmitting element fast with said lay shaft;

a power leg shaft extending orthogonally with respect to said input shaft and said lay shaft and having a drive element in constant mesh with said second drive transmitting element;

a second casing through which the power leg shaft extends, the second casing being pivotal with respect to said first casing about said lay shaft and rotatable about the axis of the power leg shaft;

a propeller drive shaft mounted in the second casing and drivingly connected to the power leg shaft;

clutch means selectively operable to drivingly connect one or the other of said first drive transmitting elements to the lay shaft to transmit rotational drive from the input shaft to the propeller shaft in a desired rotational sense, the improvement wherein;

the second casing extends through a slot in the first casing;

said slot extends arcuately about the axis of said lay shaft;

the second casing is formed with an extension having a part-spherical flange which is received within the first casing and is co-operable with a complementary spherical inner surface of the first casing; and

the center of curvature of said complementary inner surface being coincident with the point of intersection between the lay shaft and the power leg shaft whereby the second casing may pivot about the axis of the lay shaft and rotate about the axis of the power leg shaft.

4,037,559

MILK REQUIREMENT INDICATOR

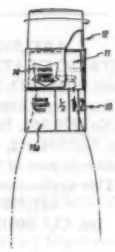
John Leslie Hopkins, 8 Carrwood Road, Bramhall, Stockport, and Arthur Holmes, Rombald, 25 Ryburn Ave., Blackburn, Lancashire, both of England

Filed Dec. 31, 1975, Ser. No. 645,669

Claims priority, application United Kingdom, Jan. 11, 1975, 1238/75

Int. Cl.[2] G09F *9/00*

U.S. Cl. 116—133 **10 Claims**



1. A tradesmans indicator comprising:

a pair of substantially identical, separable, hollow, cup members,

each cup member having a closure at one end, an opening at the other end, and a side wall with a truncated conical portion proximate said closure end and a skirt portion proximate said open end;

the truncated conical closed end portion of one said member nesting within the skirt portion at the open end of the other member;

said members being rotatable one within the other to selected angular positions when nested;

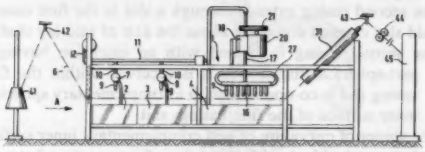
and the exposed outer surfaces of said members having cooperable indicia thereon for indicating a message to a tradesman as to reorders.

4,037,560

APPARATUS FOR DISCONTINUOUSLY APPLYING FLUID TO A STRAND-LIKE MATERIAL

Kurt Lutz, Strasse 35, Alte Schlierbacher, and Eugen Ulmer, D-7312, Kirchheim, Teck, both of Germany

Filed Mar. 16, 1976, Ser. No. 667,414
Claims priority, application Germany, Mar. 18, 1975, 2511728
Int. Cl.[2] B05B *7/00*; B05C *5/00*; D06B *1/02*
U.S. Cl. 118—314 **6 Claims**



1. An apparatus for discontinuously applying a liquid, such as a dye, onto a strand-like material such as yarn comprising

a frame;

means on said frame for guiding a yarn strand along a predetermined path relative to said frame;

spray nozzle means for ejecting a spray of liquid;

means for supporting said spray nozzle means on said frame and for repetitively moving said nozzle means transversely with respect to said path so that the outlet end of said spray nozzle means is repetitively directed toward said path;

means for supplying a liquid to said spray nozzle means whereby during the passage of the strand-like material along the path, said material is sprayed with liquid at intermittent and irregular intervals;

second spray nozzle means for ejecting a spray of liquid;

means for supporting said second spray nozzle means on said frame spaced from the first spray nozzle means in the direction of movement of the yarn strand and for rotating said second nozzle means about an axis generally perpendicular to said path so that the outlet end of said second nozzle means is repetitively directed toward said path; and

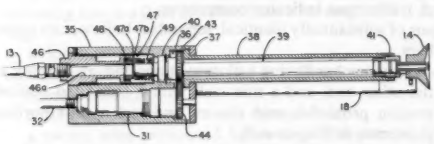
means for supplying a liquid to said second spray nozzle means.

4,037,561

ELECTROSTATIC COATING APPARATUS

Richard L. LaFave, and Richard O. Probst, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind.

Division of Ser. No. 778,362, Nov. 19, 1968, which is a continuation of Ser. No. 534,942, Feb. 17, 1966, abandoned, which is a continuation-in-part of Ser. No. 287,638, June 13, 1963, abandoned. This application Sept. 22, 1975, Ser. No. 615,575
Int. Cl.[2] B05B *5/04*
U.S. Cl. 118—629 **13 Claims**



1. An apparatus for coating an article with particles of powder comprising:

a souce of powder particles entrained in air;

means establishing an electrostatic field with respect to said article, charging particles therein and effecting deposition thereof on said article;

a distributor having a smooth, unobstructed rotating surface of nonconductive material to distribute said particles into the electrostatic field;

passage means connected to said source for delivering said entrained powder particles to the non-conductive surface, said pssage means having a non-rotating portion and a rotating portion; and

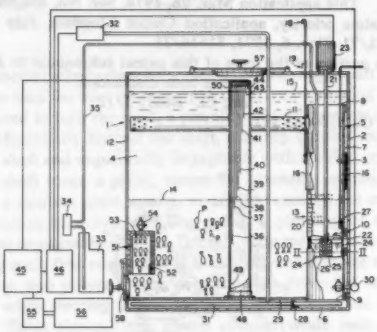
a nozzle connected with the rotating portion of the passage means to receive the entrained powder particles therefrom and having an aperture through which said mixture is discharged to impinge on and flow outwardly across said distributor surface.

4,037,562

INSTALLATION FOR CONVEYING LIVING FISH PARTICULARLY ANAESTHETIZED FISH, IN AQUEOUS MEDIUM

Jean-Marie Doutrelepont, Bellevaux-Ligneuville, Belgium

Filed Aug. 21, 1975, Ser. No. 606,732
Claims priority, application Belgium, Aug. 23, 1974, 819132
Int. Cl.[2] A01K *63/02*
U.S. Cl. 119—5 **34 Claims**



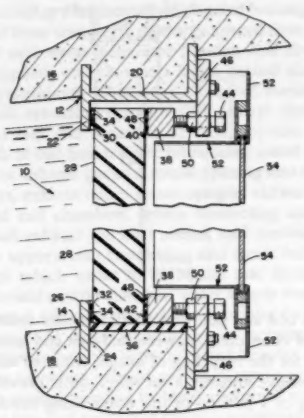
1. Installation for conveying in aqueous medium, living fish, particularly fish which have been anaesthetized, comprised of a tank and a device for supplying oxygen gas to the aqueous medium inside the tank, which comprises at least one circulation pump to cause an upward flow of the liquid in said medium, said circulation pump being arranged to suck the liquid from the tank top portion and to force said liquid back adjacent the tank bottom, said circulation pump comprising a duct connected to the tank and comprising the pump body, said duct being open at both ends thereof, the duct top end lying below the liquid level and the duct bottom end lying adjacent the tank bottom, as well as means dipping into the liquid and so arranged in the duct as to cause a liquid flow from the tank top portion, said means comprising a port substantially equally spaced from the liquid level inside the tank and the tank bottom, a screw mounted on a shaft co-axial with said duct and driven by a motor located outside said aqueous medium, said screw arranged between said port and said tank bottom, said device for supplying oxygen gas has the outlet thereof adjacent said screw at a level somewhat higher than said screw level, said motor is a varying-speed motor having at least one slow speed provided to drive said screw to prevent the suction of oxygen gas into the liquid inside said duct, and a high speed driving said screw to effect upward flow in said medium to the tank bottom portion.

4,037,563

AQUARIUM VIEWING WINDOW

John M. Pflueger, and William A. Hutcheson, both of San Francisco, Calif., assignors to John M. Pflueger, San Francisco, Calif.

Filed Mar. 29, 1976, Ser. No. 671,536
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 9 Claims



2. A Viewing window for an aquarium tank having at least one fenestration comprising:

a unitary water-pressure resistive transparent viewing panel having a viewing side and an opposing submersible side;

said panel being capable of bearing a substantial distributed pressure load on the surface of said submersible side and an equal opposing load along the periphery of said viewing side;

a lateral load bearing flange circumscribing the margin of said fenestration having one side confronting the periphery of said submersible side and an opposing side with a substantially uniformly smooth surface;

means interposed between said flange means and said submersible side periphery for sealing said fenestration to said viewing panel;

adjustable bracing means along said viewing side periphery for supporting said unitary viewing panel; and

means for urging said bracing means against said viewing side periphery thereby to maintain said sealing means in water-tight seal along said submersible side periphery.

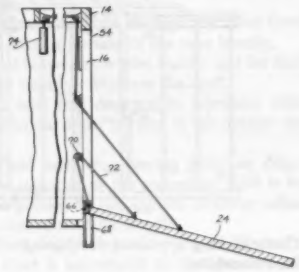
4,037,564

COLLAPSIBLE LIVESTOCK RAMP

Andrew A. Schrock, Rte. 1, Box 204, Shipshewana, Ind. 46565

Filed Aug. 20, 1975, Ser. No. 606,286
Int. Cl.[2] B62D *25/00*
U.S. Cl. 296—61 2 Claims

1. In combination a vehicle and collapsible livestock ramp, said vehicle including a livestock compartment having an elevated floor and a rear wall having a door opening therein, said ramp including a platform, means pivotally connecting said platform at one end to said vehicle adjacent said floor at said door opening wherein said platform is pivotal between a generally upright position spanning said door opening and an inclined position whereby livestock may enter or leave said compartment, the improvement comprising said platform connecting means including guide parts carried by said compartment at the rear wall thereof on each side of said door opening, each guide part extending vertically from below to at least the level of said floor, a pulley carried by said rear wall at each side of said door opening above said guide parts, said platform one end carrying support means fitting shiftably within said guide parts for guiding the movement of said platform one end between elevated and lowered positions within the guide parts as the platform is shifted between its inclined and upright positions, a pair of cable means, one of said cable means passing about each pulley and having one end connected to said platform adjacent a said support means and its opposite end con-



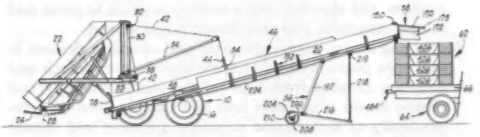
nected to said platform between said platform one end and the other end of the platform for supporting said platform one end in its elevated position within said guide parts when said platform is in its inclined position, and means extending between said compartment and platform for raising and lowering said platform between its upright and inclined positions.

4,037,565

SYSTEM FOR HARVESTING AND TRANSPORTING CHICKENS

Lloy W. Ledwell, Jr., Box 1106, Texarkana, Tex. 75501

Continuation-in-part of Ser. No. 492,348, July 26, 1974, Pat. No. 3,921,588. This application Nov. 24, 1975, Ser. No. 634,404
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—82 17 Claims



1. A system for harvesting and transporting chickens comprising:

a self-propelled vehicle having finger-carrying chicken harvesting means at one side thereof for picking up and elevating chickens as the vehicle advances;

a first conveyor carried on said self-propelled vehicle for receiving chickens from said chicken harvesting means and moving them to a second side of said vehicle;

an elongated telescoping conveyor having first and second ends, and having said first end pivotally connected to said vehicle and positioned under one end of said first conveyor at said second side of said vehicle for receiving chickens discharged from said first conveyor;

swingable boom means pivotally mounted on said vehicle for pivotation about a vertical axis and including a flexible suspension member connected to a medial portion of said elongated telescoping conveyor for swingably supporting said telescoping conveyor from said vehicle; and

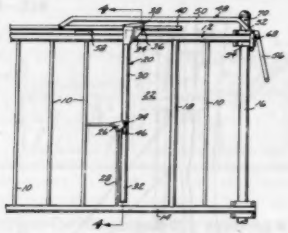
a coop assembly detachably connected to the second end of said telescoping conveyor.

4,037,566

CATTLE LOCKING APPARATUS

Teunis Albers, 21205 Norwalk Blvd., Artesia, Calif. 90701

Filed May 24, 1976, Ser. No. 689,586
Int. Cl.[2] A01K *1/06*
U.S. Cl. 119—147 **11 Claims**



1. Cattle locking apparatus comprising:

a fixed stanchion;

a release stanchion located adjacent said fixed stanchion to define a head opening for an animal, said release stanchion having an upper portion and further having actuating means located below said upper portion, said upper portion including a coupling element;

mounting means mounting said release stanchion for pivotal movement between open and closed positions, said upper portion in said open position being pivoted away from said fixed stanchion to enlarge the upper part of said head opening and thereby enable an animal to place its head through said head opening, said actuating means in said open position being located in said head opening for engagement by the neck of an animal with its head in said upper part of said head opening, said upper portion in said closed position being pivoted toward said fixed stanchion to narrow the upper part of said head opening, said actuating means being operative to pivot said release stanchion to said closed position upon movement of the animal's neck against said actuating means and into the lower part of said head opening;

release means for detachably receiving said coupling element, said release means being movable into a release position to pivot said release stanchion into said open position, and movable into a locking position to pivot said release stanchion into said closed position; and

decoupling means engageable with said coupling element in said open position of said release stanchion to detach said coupling element from said release means whereby said release means is movable into said locking position independently of said release stanchion to leave said release stanchion in said open position, said release means being operative to detachably receive said coupling element of said release stanchion when said release means is in said locking position and said release stanchion is in said closed position.

4,037,567

WATER HEATING SYSTEM INCLUDING RECYCLE LOOP

Peter L. Torres, 76 Webster Ave., Jersey City, N.J. 07303

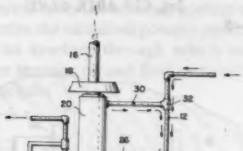
Filed Jan. 15, 1976, Ser. No. 649,538
Int. Cl.[2] F22B *33/00*
U.S. Cl. 122—20 B **4 Claims**

1. In a water heating system which includes a boiler, first conduit means connected between a water supply and said boiler, means for heating the water within and means for supplying water under pressure to said boiler, and an exhaust flue for discharging heated products of combustion from said boiler, the improvement comprising:

at least one coil of heat conductive material positioned within said exhaust flue;

second conduit means connected between said first conduit means and the lower end of said coil for withdrawing a minor portion of the water being conducted to said boiler for passage through said coil in heat exchange relation with the combustion gases discharged through said flue;

and third conduit means connected between the upper end



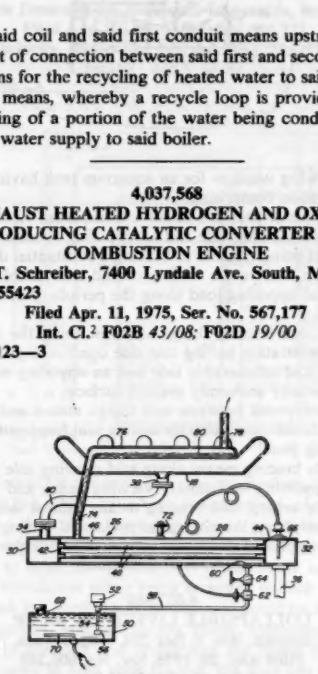
of said coil and said first conduit means upstream of the point of connection between said first and second conduit means for the recycling of heated water to said first conduit means, whereby a recycle loop is provided for the heating of a portion of the water being conducted from said water supply to said boiler.

4,037,568

EXHAUST HEATED HYDROGEN AND OXYGEN PRODUCING CATALYTIC CONVERTER FOR COMBUSTION ENGINE

Edward T. Schreiber, 7400 Lyndale Ave. South, Minneapolis, Minn. 55423

Filed Apr. 11, 1975, Ser. No. 567,177
Int. Cl.[2] F02B *43/08*; F02D *19/00*
U.S. Cl. 123—3 **3 Claims**



1. In combination with an internal combustion engine of the type having an air induction system including primary fuel inlet means and an exhaust system for combustion gases, supplemental fuel inlet means for said induction system including steam generator means having a steam outlet, a gas generator housing having a predetermined amount of iron filings disposed therein and fluid inlet and outlet means, means connecting said steam outlet with said fluid inlet means, and means communicating said fluid outlet means with said supplemental fuel inlet means, said exhaust system including portions which are heated to a high degree as a result of operation of said engine, said heated portions of said exhaust system being in good transfer relation with said gas generator housing for heating the internal surfaces thereof and said iron filings, the passage of steam through said housing and in intimate contact

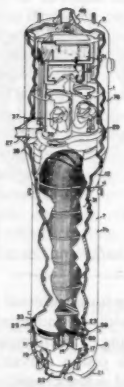
with the heated iron filings in said housing serving to further elevate the temperature of said steam and to produce hydrogen and oxygen gas for passage through said housing outlet and to said supplemental fuel inlet means, said exhaust system including an elongated exhaust manifold, said generator housing comprising an elongated tubular member through whose opposite end portions said fluid inlet and outlet means open, said tubular member being disposed in good heat transfer relation with the external surfaces of said exhaust manifold, said steam generator including a horizontally elongated housing provided with a pair of inner transverse partitions spaced from the opposite ends of said steam generator housing and dividing the latter into opposite end chambers and a central disposed between said partitions, a plurality of elongated horizontal heat transfer tubes extending through said central chamber and opening into said end chambers at their opposite ends, the opposite ends of said heat transfer tubes being sealed relative to said partitions, exhaust gas inlet means opening into one of said end chambers, exhaust outlet means opening outwardly of the other of said end chambers, means connecting said exhaust system to said exhaust gas inlet means, said central chamber including an upper outlet comprising said steam outlet and an inlet through which water to be heated into steam may be admitted into said central chamber, water supply means operatively associated with said central chamber inlet for supplying water thereto, said water supply means including heating means operative to heat the water supplied thereby, said water supply means including exhaust gas temperature sensing controlled valve means operative to admit additional quantities of heated water into said water and steam compartment means in response to the temperature of the exhaust gas at said outlet end of said exhaust conduit means being elevated to a predetermined level.

4,037,569

FLOW DISTRIBUTION ARRANGEMENT FOR A STEAM GENERATOR

Robert R. Bennett, Clearwater, and Wilbur M. Byerley, Riverview, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1976, Ser. No. 653,988
Int. Cl.[2] F22B *1/06, 37/48*
U.S. Cl. 122—32 **10 Claims**



1. A vapor generator in which heat is transferred from a primary to a sencondary fluid to vaporize the latter, said vapor generator comprising:

a vertically oriented shell,

a plurality of U-shaped tubes disposed in said shell so as to form a tube bundle having an open lane adjacent the tubes having the shortest radius bends,

a head portion having a tubesheet with holes for receiving said tubes and a dividing plate which cooperates to form headers for each end of the U-shaped tubes,

a primary fluid inlet nozzle in fluid communication with one header,

a primary fluid outlet nozzle in fluid communication with the other header,

whereby the primary fluid flows through the tubes forming a hotleg and a coldleg portion of the tube bundle,

a wrapper disposed between the tube bundle and the shell to form an annular chamber adjacent the shell,

a secondary fluid inlet ring disposed to introduce influent secondary fluid to the upper portion of the annular chamber,

said secondary fluid inlet ring having ports so disposed therein that the majority of the secondary fluid is introduced into that portion of the annular chamber adjacent the hotleg portion of the tube bundle,

said secondary fluid ring having said ports so disposed that no secondary fluid is introduced to that portion of the annular chamber adjacent the said open lanes,

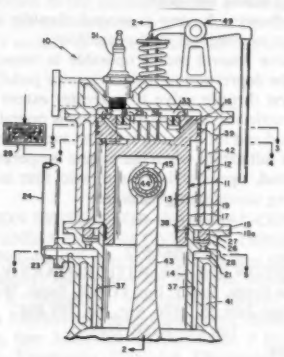
said annular chamber being generally free from obstructions, whereby the flow distribution of secondary fluid across the tubesheet is improved.

4,037,570

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

Henry E. Bailey, P.O. Box 749, Orinda, Calif. 94563; Dennis H. Bailey, Rte. 1, Box 45, Clear Lake, Calif. 95457, and Richard E. Bailey, P.O. Box 6327, Clearlake Highlands, Calif. 95422

Filed Feb. 9, 1976, Ser. No. 656,306
Int. Cl.[2] F01L *11/00*
U.S. Cl. 123—47 A **4 Claims**



1. In a four-stroke cycle internal combustion engine, means forming at least one cylinder, said cylinder means including an upper cylinder wall having a given diameter and a lower cylinder wall having a diameter less than said given diameter, piston means mounted for reciprocating movement within the cylinder between successive intake, compression, expansion and exhaust strokes, said piston means having a piston head mounted for movement within the upper cylinder wall and defining therewith a combustion chamber together with a piston skirt mounted for movement within the lower cylinder wall, said piston skirt being radially spaced from the upper cylinder to define therewith a pumping chamber, cylinder valve means for directing air into the pumping chamber, intake valve means for directing a fuel-air mixture into the combustion chamber only during the intake stroke, exhaust valve means for directing exhaust gases out of the combustion chamber during the exhaust stroke, piston valve means in the piston

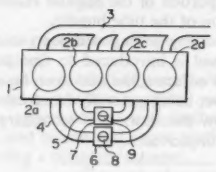
means for opening only during a terminal portion of both the intake and expansion stroke for injecting air from the pumping chamber directly into the combustion chamber to form a layer of fresh air below said fuel-air mixture during said intake and compression strokes and to form a layer of fresh air below said exhaust gases during a terminal portion of the expansion stroke and during the exhaust stroke, and means for igniting a compressed combustible mixture within the combustion chamber.

4,037,571

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 18, 1976, Ser. No. 697,478
Claims priority, application Japan, Mar. 9, 1976, 51-024571
Int. Cl.[2] F02B *75/08;* F02M *13/04;* F02B *75/20*
U.S. Cl. 123—52 R **4 Claims**



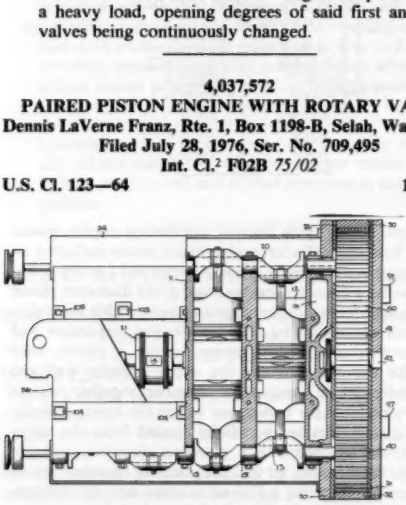
1. A multi-cylinder internal combustion engine for use in a vehicle having an accelerator pedal, comprising:
at least a first cylinder group and a second cylinder group, each cylinder group comprising at least one cylinder;
a first and second intake manifolds connected to said first and second cylinder groups, respectively;
a first carburetor having a first throttle valve and mounted on said first intake manifold;
a second carburetor having a second throttle valve and mounted on said second intake manifold;
a throttle valve control means operable in response to an extent of the depression of the accelerator pedal for opening said first throttle valve to a greater extent than said second throttle valve when the engine is operating under a partial load and for opening said first and second throttle valves to a full extent when the engine is operating under a heavy load, opening degrees of said first and second valves being continuously changed.

4,037,572

PAIRED PISTON ENGINE WITH ROTARY VALVES

Dennis LaVerne Franz, Rte. 1, Box 1198-B, Selah, Wash. 98942

Filed July 28, 1976, Ser. No. 709,495
Int. Cl.[2] F02B *75/02*
U.S. Cl. 123—64 **16 Claims**



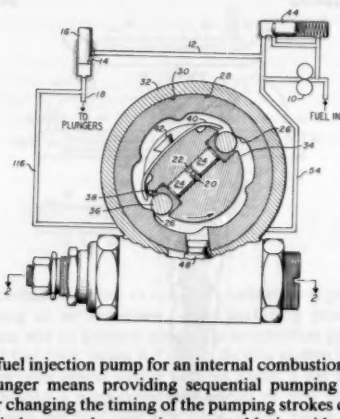
1. An internal combustion engine comprising
a block having a plurality of cylinders therein,
a pair of pistons having opposed piston heads in each of the cylinders;
a pair of crankshafts driven by the pistons,
intake means,
exhaust means,
a rotary valve adjacent the cylinders and the intake and exhaust means, comprising rotors having
intake passages which open the cylinders to the intake means during a portion of the rotation of the rotor corresponding to the intake cycle of the engine,
exhaust passages which open the cylinders to the exhaust means during a portion of the rotation of rotor corresponding to the exhaust cycle of the engine,
and second exhaust passages which open the cylinders during a portion of the rotation of the rotor corresponding to a second exhaust cycle of the engine.
13. An internal combustion engine comprising
a block having a plurality of cylinders therein;
a pair of pistons having opposed piston heads in each of the cylinders,
a pair of crankshafts driven by the pistons
intake means,
exhaust means,
a rotary valve adjacent the cylinders and the intake and exhaust means, comprising rotors having
intake passages which open the cylinders to the intake means during a portion of the rotation of the rotor corresponding to the intake cycle of the engine,
exhaust passages which open the cylinders to the exhaust means during a portion of the rotation of the rotor corresponding to the exhaust cycle of the engine,
and a second intake passage which opens the cylinder during a portion of the rotation of the rotor corresponding to a stratified charge intake cycle of the engine.

4,037,573

TIMING CONTROL FOR FUEL INJECTION PUMP

Joseph Edward Swift, South Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 21, 1976, Ser. No. 688,828
Int. Cl.[2] F02M *59/20*
U.S. Cl. 123—139 AQ **8 Claims**



1. In a fuel injection pump for an internal combustion engine, pump plunger means providing sequential pumping strokes, means for changing the timing of the pumping strokes comprising a cylinder, an advance piston movable in said cylinder, means interconnecting said advance piston with said pump plunger means to advance and to retard the relative timing of the pumping strokes, a source of fluid having a pressure correlated with engine speed providing a speed related pressure, a hydraulic chamber at one end of said piston connected to said source of fluid under pressure to move the advance piston to advance the timing of the pumping strokes in response to increased engine speed, first means for controlling the delivery

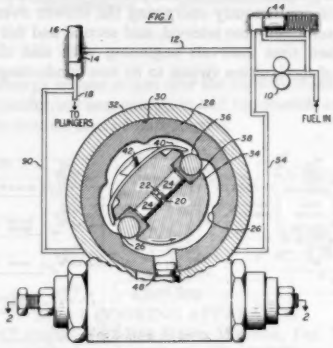
of fluid from said source to said hydraulic chamber, said first means including means for preventing the delivery of fluid from said source to said hydraulic chamber until a predetermined speed is reached, and second means for controlling the delivery of fluid from said source to said hydraulic chamber, said second means bypassing said first means to deliver fluid from said source to said hydraulic chamber during the starting of the engine thereby to advance the timing of the pumping strokes.

4,037,574

TIMING CONTROL FOR FUEL INJECTION PUMP

Joseph Edward Swift, South Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 21, 1976, Ser. No. 688,829
Int. Cl.[2] F02M *59/20*
U.S. Cl. 123—139 AQ **6 Claims**



1. In a fuel injection pump for an internal combustion engine, pump plunger means providing sequential pumping strokes, means for changing the timing of the pumping strokes comprising a cylinder, an advance piston movable in said cylinder, means interconnecting said advance piston with said pump plunger means to advance and to retard the relative timing of the pumping strokes, a source of fluid having a pressure correlated with engine speed, a first hydraulic chamber at one end of said advance piston connected to said source of fluid to move the advance piston to advance the timing of the pumping strokes in response to increased engine speed, means for controlling the delivery of fluid from said source to said first hydraulic chamber, said means including means for preventing the delivery of fluid to said first hydraulic chamber until a predetermined speed is reached thereby to retard the timing of the pumping strokes during engine cranking, movable stop means engageable with said advance piston, a second hydraulic chamber for receiving fluid from said source to urge said movable stop toward said advance piston, and means providing continuous communication between said fluid source and said second hydraulic chamber whereby said movable stop limits the maximum retard position of said advance piston to a lesser amount as soon as the engine starts.

4,037,575

ALTITUDE COMPENSATED FUEL CONTROL SYSTEM

Mark F. Sommars, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

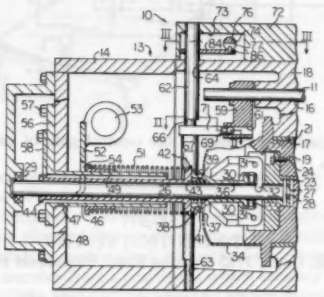
Filed Aug. 25, 1975, Ser. No. 607,322
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 MC **6 Claims**

1. An altitude compensated fuel control system for an internal combustion engine comprising;

a fuel control member for controlling flow of fuel to the engine;

first means for controlling the position of the fuel control member including a stop for limiting movement of the control member towards an increased fuel flow direction establishing a maximum fuel flow position of the fuel control member;

second means for adjusting the maximum fuel flow position of the fuel control member in direct response to changes in altitude and hence to changes in atmospheric pressure resulting from changes in altitude so that the maximum amount of fuel delivered to the engine decreases with an increase in altitude; and



wherein the fuel flow is controlled by rotary motion of the fuel control member, said first means includes a lever attached to the fuel control member and having a distal end, a pivot shaft having an eccentric intermediate portion formed thereon, a bell crank pivotally mounted on said eccentric portion and having a first arm and a second arm with said first arm pivotally associated with said distal end of said lever, and a speed responsive governor operatively connected to the second arm for pivoting the bell crank about the eccentric portion so that the first arm imparts rotary motion to the lever and the fuel control member.

4,037,576

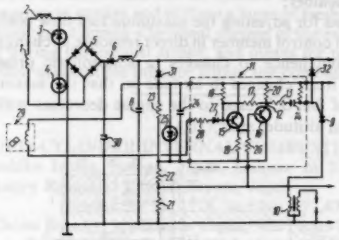
IGNITION SYSTEM FOR INTERNAL-COMBUSTION ENGINES NEGATIVE BIAS TRIGGER

Alexandr Nikolaevich Alexeev, Saratovskaya ulitsa, 18/10, kv. 269, Moscow; Igor Ivanovich Zhmurin, shosse Entuziastov, 7a, kv. 6, Balashikha Moskovskoi oblasti; Alexandr Antonovich Moskovsky, Scherbakovskaya ulitsa, 58a, kv. 222, Moscow; Igor Minovich Oparin, ulitsa 9 Rota, 17, kv. 27, Moscow; Vyacheslav Ivanovich Cheplanov, 11 Parkovaya ulitsa, 48, korpus 2, kv. 46, Moscow; Leonid Shlemovich Sokolin, ulitsa Konstantinova, 32, korpus 2, kv. 3, Moscow, all of U.S.S.R.; Vladimir Semenovich Zolotarevsky, deceased, late of Moscow, U.S.S.R.; by Alla Meerovna Zolotarevskaya, and Maiya Vladimirovna Zolotarevskaya, administrators, both of Pulkovskaya ulitsa, 11, korpus 1, kv. 33, Moscow, U.S.S.R.

Filed Aug. 5, 1975, Ser. No. 602,025
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 R **1 Claim**

1. An internal-combustion engine ignition system comprising: a power source with a voltage stabilizer; a capacitor connected through a rectifier to said power source; electric circuits connected in parallel with said capacitor, each circuit including an ignition coil in series with a thyristor, to the control gate of which is connected a pulse shaper circuit with a control pulse generator; an arrangement for applying a negative bias to the control gates of said thyristors, which arrangement comprises a diode whose anode is connected to the cath-

ode of each of said thyristors, whereas the cathode of said diode is connected to said capacitor and is also connected



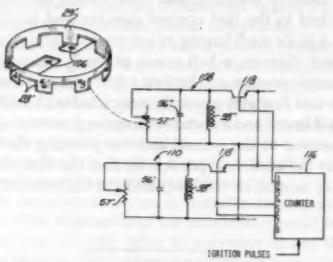
through isolation diodes to the control gate of each of said thyristors.

4,037,577

AUTO IGNITION SYSTEM

Michael R. Gallo, 3733 Quarton Road, Bloomfield Hills, Mich. 48033

Filed July 8, 1974, Ser. No. 486,635
Int. Cl.[2] F02P *1/00, 5/04*
U.S. Cl. 123—148 E **4 Claims**



1. An automative ignition system for a multicylinder engine comprising a distributor element rotatable in proportion to engine speed, interrupter means mounted for rotation with said member, a tunable timing circuit, actuator means responsive to the proximity of said interrupter means and operatively associated with said timing circuit to produce an ignition timing signal quantity, addressable memory means operatively associated with said timing circuit and responsive to input addresses to tune said timing circuit so as to optimize said timing signal quantity produced thereby, and means for selectively progressively addressing said memory means for the ignition times of each cylinder of said engine.

4,037,578

IGNITION SAFETY CONTROL SYSTEM

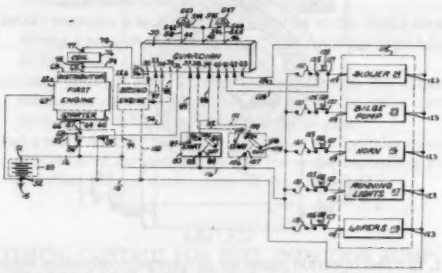
James E. Dersch, Mound, and James L. Maciey, Rosemount, both of Minn., assignors to Nautec, Inc., Excelsior, Minn.

Continuation of Ser. No. 504,155, Sept. 9, 1974, abandoned, which is a continuation of Ser. No. 339,856, March 9, 1973, abandoned. This application July 28, 1975, Ser. No. 599,468
Int. Cl.[2] F02N *17/00;* B63J *2/00*
U.S. Cl. 123—179 BG **12 Claims**

1. An electronic safety control apparatus for controlling the energization of an internal combustion engine of the type mounted in an enclosed engine compartment equipped with venting apparatus including an electrical blower operable when energized to ventilate the compartment, and in circuit with a battery, an electrical starter, an ignition coil and an ignition switch operable in conducting and non-conducting modes, the electronic safety control apparatus comprising:

a. first electronic switching means opeatively connected to the blower and to monitor the operative state of the ignition switch, responsive to a change in state of the ignition switch from its non-conducting mode to its conducting mode for continuously energizing the blower when the ignition switch is in its conducting mode and for automatically producing a continuous first enabling output signal delayed in time from the instant of said change in state of the ignition switch from its non-conducting mode to its conducting mode by a first predetermined time interval;

b. second electronic switching means operatively connected to the blower, to receive said first enabling signal and to monitor the operative state of the ignition switch, responsive to receipt of said first enabling signal and to change in state of the ignition swtich from its conducting mode to its non-conducting mode for producing a second continuous enabling signal over a second predetermined time interval and for continuously energizing the blower over a third predetermined time interval, said second and third predetermined time intervals beginning with said change in state of the ignition switch to its non-conducting mode;



c. blocking circuit means operatively connected in circuit with the starter and to receive said first and second enabling signals for electrically connecting and disconnecting the starter from energization, said blocking circuit means being normally operative in a first state to electrically disconnect the starter from energization and being operative in a second state when in receipt of said first or second enabling signals to electrically connect the starter for energization;

d. electronic engine sensing means operatively connected to the ignition coil for sensing electrical pulses passing through the ignition coil to energize the engine for providing a recylcing output signal after said sensed electrical pulses have continuously been applied to the engine for a fourth predetermined time interval, beginning with the first one of such sensed pulses; and

e. recycling circuit means operatively connected to said electronic engine sensing means, responsive to receipt of said recycling output signal for recycling said first electronic switching means to de-energize the blower until a subsequent change in state of the ignition switch from its non-conducting mode to its conducting mode.

4,037,579

ENERGY STORAGE-BOILER TANK USING SALT FUSION AND HEAT PIPING

Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207

Filed Jan. 26, 1976, Ser. No. 652,272
Int. Cl.[2] F24H *7/04*
U.S. Cl. 126—400 **7 Claims**

1. An energy storage-boiler means, which comprises:

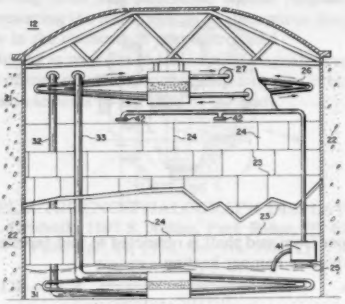
a housing having a closed top and bottom,

a vaporizable compound in the bottom area of said housing,

a plurality of layers of salt filled canisters substantially filling said housing above said vaporizable compound;

a plurality of boiler pipes in the closed top area of said housing above said salt filled canisters;

an input and output connected with said boiler pipes; and



a heat energy release means near the bottom of said housing for transferring heat energy to said vaporizable compound in the bottom area of said housing.

4,037,580

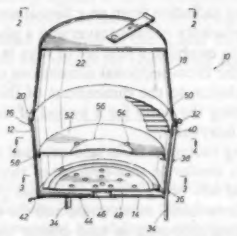
MEAT COOKING APPARATUS

Nicholas C. Angelo, 8702 Bob White, Houston, Tex. 77036

Filed June 2, 1975, Ser. No. 582,724

Int. Cl.[2] A47J *37/07*; F24B *3/00*

U.S. Cl. 126—25 R 7 Claims



1. For use in a cylindrical barbeque pit having a housing supported on a set of legs and which housing encloses a fire grate in the lower portions thereof and a meat receiving grill is located above the fire grate, the improvement comprising a baffle plate which has a shape closing off the housing between the fire grate and the meat receiving grill and which further defines an edge located gap about said baffle to enable heat and smoke to rise therepast to indirectly impinge on the meat and wherein said baffle is a solid member having grease and dripping collecting surface comprising,

a circular inner sloping surface connected to

an outer sloping surface, said connection forming a circular valley disposed near the center of said housing

the inner and outer sloping surface having sufficient slopes for grease and drippings to flow toward said valley,

said valley intersecting an opening means for dropping collected grease and drippings into the fire below for burning and which opening is sufficiently small to prevent upward flaring of flames to impinge on the meat receiving grill.

4,037,581

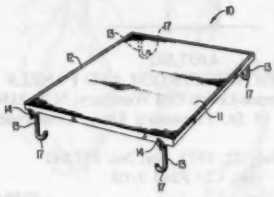
SCREEN DEVICE FOR STOVE OVENS

Thomas Trifiletti, Albany, N.Y., assignor to Lucia F. Friese; Mary A. Krauss and Lewis Trifiletti, all of Albany, N.Y., part interest to each

Filed May 25, 1976, Ser. No. 689,688

Int. Cl.[2] A21B *1/42*

U.S. Cl. 126—39 M 3 Claims



1. A screen device for use in preventing grease from splattering within a stove oven, comprising:

a screen member in sheet form, said screen member having pivotally attached thereto a plurality of leg members each of which is pivotable about its point of attachment to the screen member from a position in which each leg member is essentially perpendicular to said screen member to a position in which said leg member is essentially parallel to and in the same plane with said screen member, each of said leg members having a U-shaped portion at the outer end thereof, said U-shaped end portion providing for said end portion to rest upon a rack within said oven or to support the screen in an inverted position from the electric coils in the upper portion of an electric oven.

4,037,582

OIL STOVE

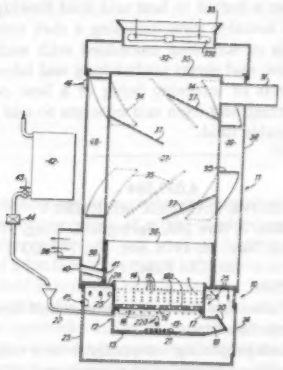
Isaac N. Moody, Glenrothes, Scotland, assignor to Industrial & Marine Services (Scotland) Limited, Kirkcaldy, Great Britain

Filed Nov. 26, 1975, Ser. No. 635,292

Claims priority, application United Kingdom, Nov. 27, 1974, 51310/74

Int. Cl.[2] F24H *3/06*

U.S. Cl. 126—116 R 8 Claims



1. A heating appliance incorporating combustion apparatus comprising an open pan having a floor portion and a cylindrical side-wall portion with perforations therein, the interior of said pan being divided by a fire plate in the form of a partition arranged generally parallel with and spaced from said floor portion, said partition having therein apertures which are arranged in concentric rings and are alternately convergent and divergent in the direction away from said floor portion of

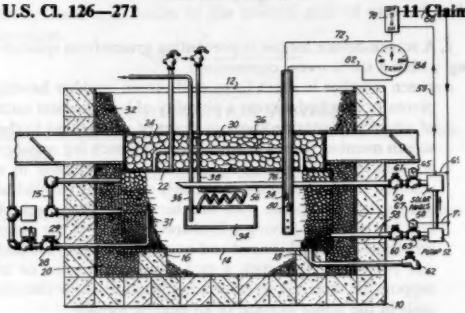
said pan, said perforations in said side-wall portion being disposed in circumferential rows both above and below said partition with the perforations in the uppermost row being smaller and more closely spaced than in the other rows, means for introducing oil into said pan at a point between said floor portion and said partition, heating means within said pan close to said floor portion, a flue duct extending from the open side of said pan, and heat exchange means surrounding said flue duct.

4,037,583

SOLAR HEATING SYSTEM AND PANELS

Paul Bakun, 14 Terrace Court, Old Westbury, N.Y. 11568, and Clifford Porter, 13 St. Eleanora's Lane, Crestwood, N.Y. 10707

Filed July 21, 1975, Ser. No. 597,541
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **11 Claims**



1. Solar heating apparatus comprising a source of a heatable fluid, solar heating means to receive heat from the sun and heat said fluid therewith, heat sink means to receive the fluid from said solar heating means and to store heat received with said fluid, and heat transfer means to transfer heat from said heat sink means to a heating system medium; said solar heating means comprising at least one solar heating panel; each said solar heating panel comprising an array of tubes of a heat conductive material which is substantially inert to said fluid, and a heatable mass to which said array is coupled and by which said array is heated to heat said fluid flowing through said tubes; said heatable mass including a dark colored concrete and sheets of screening embedded with said array of tubes in said mass, said sheets sandwiching said tubes therebetween, said sheets of screening being of a heat conductive material conducting heat from said concrete to said tubes and thus to said heatable fluid.

4,037,584

STOVE DAMPER ASSEMBLY

Baxter Fisher, Rte. 3, Box 285, Springfield, Oreg. 97477

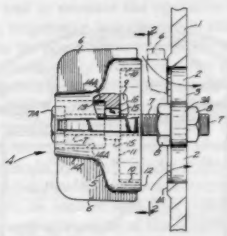
Filed Nov. 18, 1976, Ser. No. 743,233
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—290 **4 Claims**

1. A damper assembly for vented stoves and furnaces and comprising in combination,

a threaded shaft projecting outwardly from a vent defining upright member, means at the outer end of said shaft limiting outward damper movement,

locking means in place on said shaft lockably securing same to said upright member, and

a damper in supported engagement with said shaft and adapted to be positioned therealong to open and close said vent, said damper including front and rear internal wall surfaces defining front and rear damper recesses, an internal flange intermediate said recesses, traveler means disposed on said flange intermediate said front and rear recesses and in axially adjustable engagement with said shaft whereby surface contact and conductance of heat to the



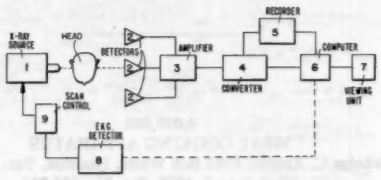
damper from said shaft is restricted to said traveler means to minimize damper heating.

4,037,585

METHOD OF MEASURING BLOOD FLOW BY RADIATION

Philip L. Gildenberg, 6218 Claridge, Houston, Tex. 77035

Filed Oct. 10, 1975, Ser. No. 621,539
Int. Cl.[2] A61B *6/02*
U.S. Cl. 128—2 A **30 Claims**



1. A method of measuring relative blood flow through at least a part of the body using penetrating radiation, comprising the steps of:

a. transmitting radiation from an external source through the body in a plurality of rays traversing a plurality of respective paths to establish a first set of rays in a planar slice of the body, the cross-sectional dimensions of each ray being small in relation to the dimensions of the body and each ray traversing the body for a period of time at least equal to a pulse interval;

b. transmitting radiation from said external source in further sets of rays similar to said first set of rays;

c. one of said sets being disposed in said planar slice at an initial angle or initial mean angle and the other of said sets of rays being disposed in said planar slice at angles or mean angles different from each other and from said initial angle or initial mean angle;

d. the sets of rays being such that every element of a two-dimensional matrix of elements of the body in said planar slice is intersected by a group of said rays, the group of rays being different for the different elements of the matrix, each element of said matrix having dimensions of the order to magnitude of the cross-sectional dimensions of said rays;

e. deriving from each ray emerging from the body over the period of time at least equal to a pulse interval a number of momentary output signals, each said signal representing the momentary sum of the transmissions or absorptions of the elements of the body intersected by the ray;

f. determining from said momentary signals a difference signal representing the maximum difference between said momentary signals for each ray over said period of time;

g. deriving sets of discrete difference signals corresponding to the sets of rays, said difference signals being indicative of the transmission or absorption of blood flowing through each element of said matrix, the number of differ-

ence signals being sufficient to determine substantial discrimination between the transmission or absorption coefficients due to blood flow through neighboring elements of the matrix;

h. deriving from said difference signals resultant signals representing the transmissions or absorptions due to blood flow in the elements of said matrix; and

i. producing in response to said resultant signals a representation of the transmissions or absorptions due to blood flow in said elements of the slice of the body.

4,037,586

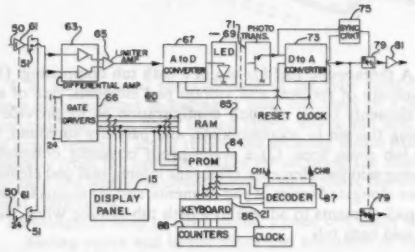
ELECTROENCEPHALOGRAPH DISPLAY

James A. Grichnik, 1107 S. Aldine, Park Ridge, Ill. 60068

Filed Apr. 14, 1976, Ser. No. 676,721

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.1 B **6 Claims**



1. A digital electroencephalograph system including a plurality of electrically responsive terminals connectable to a patient's head for obtaining electrical signals, electronic circuit means for scanning said terminals for obtaining analog electrical signals from said terminals in selectable format, means for converting said analog signals to data in digital format, means for providing visual display of the selected format in which the terminals are scanned and thus of the actual format in which the data is obtained, and means for converting said data into an output analog signal.

4,037,587

VALVE ASSEMBLY FOR A SPHYGMOMANOMETER

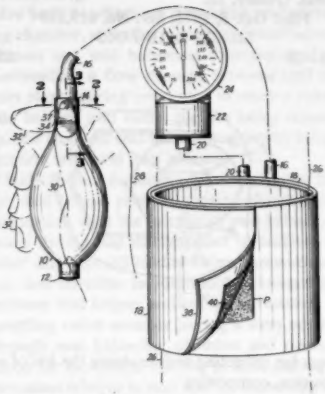
Nobuo Kaneda, Komae; Takenosuke Tokisono, Tokyo, and Teizo Uchida, Kawaguchi, all of Japan, assignors to Bristoline Inc., Island Park, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,703

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 G **8 Claims**

8. A valve assembly for a sphygmomanometer comprising a body having an air passageway, a pumping bulb, coupling means at one end of said passageway to connect said body to the pumping bulb, a sphygmomanometer cuff, coupling means at the other end of said passageway to connect said body to said sphygmomanometer cuff, an egress check valve adjacent said bulb, an ingress check valve at an ingress opening to said bulb, a bleed valve adjacent said bulb and connected to said air passageway, said egress check valve being located between said bleed valve and an egress opening from said bulb, said bleed valve having a manually manipulatable control element positioned to be readily accessible to the finger tip of the hand of a user pumping the bulb, said control element being freely floating and pivotally mounted for movement from a valve closed position to a valve bleeding position, and resilient means to bias the control element to valve closed position, whereby said control element can be depressed against the bias so that finger pressure on said pivoted control element can accurately



regulate the rate at which air is bled through said air passageway from said sphygmomanometer cuff.

4,037,588

LARYNGOSCOPES

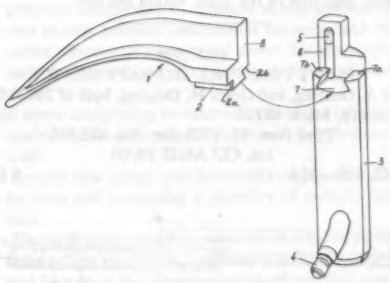
Helmut Heckele, Knittlingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Mar. 15, 1976, Ser. No. 666,602

Claims priority, application Germany, Sept. 11, 1975, 7528678[U]

Int. Cl.² A61B *1/06*

U.S. Cl. 128—11 **4 Claims**



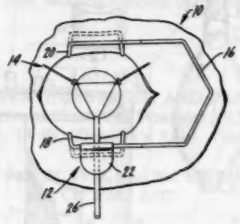
1. A laryngnoscope comprising an elongated handle member, a spatula member made of a light-conducting material, said handle member when held in a vertical position presenting at its upper end a flat face in a vertical plane inwardly off-set from the longitudinal axis of the handle member, said handle member when so held also presenting both a dove-tailed mounting slot and flat upwardly facing horizontal shoulders on either side of the slot extending perpendicularly outward of the flat face, light emitting means mounted in the handle and having a light emitting element located in said flat face to illuminate the proximal end of the spatula member when mounted on the handle member, and said spatula member presenting at its proximal end a flat face complemented to the flat face of the handle member and having at its proximal end both a dove-tailed mounting projection and a pair of flat shoulders, both located beneath the flat face of the spatula, and complementalyslidable into and on to the mounting slot and flat shoulders of the handle member.

4,037,589

OCULAR SURGICAL SYSTEM

William U. McReynolds, Quincy, Ill., assignor to William U. McReynolds, Qunicy, Ill.

Filed Oct. 3, 1975, Ser. No. 619,189
Int. Cl.[2] A61B 17/02
U.S. Cl. 128—20 15 Claims



1. A system for retracting and retaining the iris of an eye in a dilated position, comprising

first means for retracting the iris, said first means including a shaft with a curved end for insertion within a first incision in the eye and engagement with the edge of the iris,

resilient means disposed about said shaft to grip the shaft and maintain the shaft in a fixed position,

means for maintaining said resilient means stationary in a position adjacent the eye,

at least one second means for retracting the iris, said second means including a length of wire with a shank having a hook formed at one end for insertion within a second incision in the eye, and

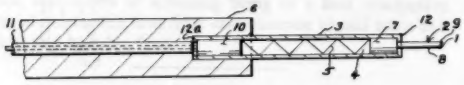
a flexible shield means disposed about the shank of said length of wire and movable thereon to adjoin the surface of the eye to prevent loss of aqueous fluid from the incision and to retain the length of wire in a particular position after insertion of the hook within the eye.

4,037,590

POINT PRESSURE THERAPY DEVICE

Albert A. Dohring, and Grace H. Dohring, both of 24028 Union, Dearborn, Mich. 48124

Filed Nov. 17, 1975, Ser. No. 632,366
Int. Cl.[2] A61H 39/00
U.S. Cl. 128—24.4 6 Claims



1. A therpeutic device to apply localized pressure, including,

a pressure member,

an elongated carrier for said pressure member,

a carrier holder elongated on longitudinal axis,

a hole formed in said holder elongated on and approximately concentric with said longitudinal axis,

said carrier including a piston, said piston being received in said hole to support said carrier for reciprocable sliding travel along said longitudinal axis, said piston having an inner end face,

means to resist escape of said piston from said hole,

said carrier further including a rod portion slidably protruding through said means to resist escape, said rod portion being a smaller diameter than said piston, said rod portion revolubly and terminally carrying said pressure member exteriorly of said holder for application to the skin of a patient,

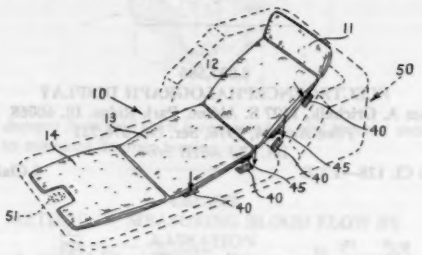
means carried by said holder effective upon said piston to urge said carrier under variable pressure toward the skin of patient in the use of the device.

4,037,591

BATH TUB THERAPEUTIC PAD

Jay J. Sarno, 2880 Las Vegas Blvd. South, Las Vegas, Nev. 89109

Filed July 2, 1976, Ser. No. 702,288
Int. Cl.[2] A61H 1/00
U.S. Cl. 128—33 9 Claims



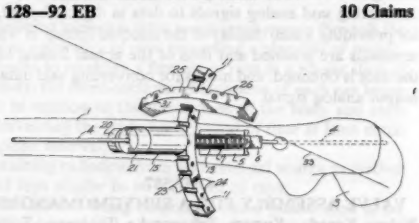
1. A therapeutic pad for use in a bath tub comprising: (1) a multiplicity of resilient and vibrant pad elements, one of said pad elements being of such configuration as to provide an opening therein to accommodate, and partially surround, the bath tub drain area; (2) a water-proof covering completely encasing said pad elements; (3) means joining said pad elements into an elongated series of pad elements; and (4) means to cause said pad elements to adhere to a bath tub surface when water is in said bath tub.

4,037,592

GUIDE PIN LOCATING TOOL AND METHOD

Richard F. Kronner, Rte. 2, Box 583, Roseburg, Oreg. 97470

Filed May 4, 1976, Ser. No. 682,833
Int. Cl.[2] A61B 17/18; A61F 5/04
U.S. Cl. 128—92 EB 10 Claims



1. A tool for use in the positioning of a surgical guide pin within the neck and head portions of a femur preparatory to hip nail installatin, said tool comprising,

a base adapted for surfacial abutment against the femur exterior offset from the guide pin axis and supported by a first surgical guide pin projecting outwardly from the femur, said base including an outwardly extending arm and arm extension,

a guide member rotatably mounted on said base and positionable about the axis of said first surgical guide pin preparatory to the taking of AP and lateral X-ray photographs of the femur with inserted surgical guide pin and attached tool,

retention means holding said guide member against undesired rotational movement in perpendicularly related position during the taking of the X-ray photographs, and

said guide member having indices thereon discernible on the AP and lateral X-ray photographs to enable the plotting of a corrected course for a second guide pin, said indices also facilitating the positioning and axial guidance of a

second surgical guide pin for entry of same into the femur along said corrected course.

4,037,593

SURGICAL MASK WITH VAPOR BARRIER

George W. Tate, Jr., Dallas, Tex., assignor to Giles C. Clegg, Jr. and John R. Lynn, both of Dallas, Tex.

Filed Nov. 28, 1975, Ser. No. 635,970
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] A62B 7/10
U.S. Cl. 128—146.2 4 Claims

1. In an improved surgical mask of the type comprising a main body member including at least one layer of a filtering material, said main body having upper, lower and side edges, an upper region, a lower region and securing means extending laterally from the opposite edges for securing the mask over the face of a wearer to cover the nose and mouth, the improvement comprising;

an elongated strip of deformable, closed cell foam material having upper and lower edges and adaptable to the contours of the nose and cheek bones of the wearer attached to the inner surface of the upper region of the mask with the upper edge extending substantially across the entire upper edge of said main body, and being of sufficient width between the upper and lower edges to prevent flow of vapor through the upper region of the main body in the vicinity of optical aids used by the wearer of the mask, and

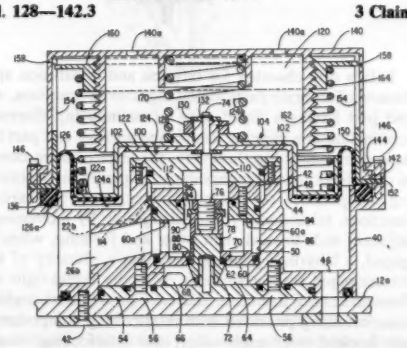
deformable means for assisting in maintaining a desired contour to said strip and holding said strip against the wearer's face in sealing relationship.

4,037,594

EXHAUST REGULATOR VALVE FOR PUSH-PULL DIVING SYSTEM

Peter S. Riegel, Columbus; Stephen E. Magill, Circleville, and Dwain R. Schroeder, Columbus, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,320
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.3 3 Claims



1. Push-pull diving apparatus including a helmet, pressure and suction lines for supplying breathing gas to said helmet from a source and returning exhaust gas to said source, and an exhaust regulator valve mounted on said helmet, said exhaust valve comprising:

a valve body in which are defined an inlet plenum, a balancing chamber, an outlet plenum disposed between said inlet plenum and said balancing chamber, and a valve seat surrounding a flow passage between said plenums, said inlet plenum being connected to receive exhaust gas from said helmet, said outlet plenum being connected to said suction line, and said balancing chamber being in communication with said inlet plenum;

said body further defining a helmet pressure sensing chamber, said helmet pressure sensing chamber being in communication with the interior of said helmet;

a piston having one side exposed to ambient pressure, the other side exposed to said helmet pressure sensing chamber, and movable in response to changes in differential between said helmet and ambient pressures;

a throttling valve member having a stem portion extending through said balancing chamber and connected to said piston for movement thereby in both closing and opening directions relative to said seat for increasing or decreasing throttling of exhaust gas flow from said inlet plenum to said outlet plenum;

said valve member having substantially equal areas exposed to said inlet plenum and to said balancing chamber, whereby forces acting on said valve member due to pressure differentials between said inlet and outlet plenums are substantially cancelled by forces acting on said valve member due to similar pressure differentials between said balancing chamber and said outlet plenum;

load means, acting on said piston, for effecting a predetermined force thereon in said valve member closing direction, whereby said regulating valve is operative to variably restrict exhaust gas flow from said inlet plenum to said outlet plenum so as to maintain pressure in said helmet at a predetermined differential relative to said ambient pressure irrespective of changes in said ambient pressure and in said pressure differential between said inlet and outlet plenums; a cup-shaped cover having a cylindrical outer wall and mounted on said body for rotation about its axis;

said cover comprising an externally threaded tubular boss in spaced concentric relation within said cylindrical outer wall;

an annular first spring seat threadedly engaged on said tubular boss and presenting a plurality of radially extending lugs;

a cylindrical guide member mounted on said body concentrically within said cover, and having axial slots engaged by said lugs so as to prevent rotation of said first spring seat about said axis;

said load means comprising concentric first and second compression springs, said first compression spring being disposed between said cylindrical outer wall and said tubular boss and compressed between said first spring seat and said piston, and said second compression spring being disposed within said tubular boss and compressed between said cover and said piston, whereby upon rotation of said cover in one direction or the other about said axis said first spring seat is moved axially along said tubular boss to vary the length of said first compression spring while maintaining the length of said second compression spring substantially constant.

4,037,595

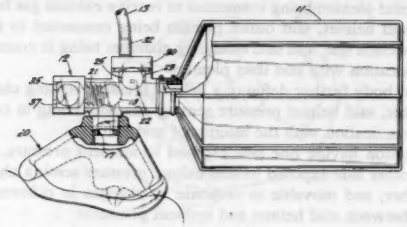
BREATHING EQUIPMENT SUCH AS RESUSCITATORS

James O. Elam, 950 E. 59th St., Chicago, Ill. 60637

Continuation-in-part of Ser. No. 460,139, April 11, 1974. This application Sept. 17, 1975, Ser. No. 614,030

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.7 1 Claim



1. A resuscitator valve mechanism including a valve chamber having opposed inspiration and expiration ports in opposite ends thereof each having a valve seat surrounding the port, and the chamber having a port in a side wall of said chamber between the ends thereof for communication with the patient's lungs, a light weight ball valve in said chamber having clearance for gas flow around the valve adjacent the side walls of the chamber and being movable in opposite directions to engage either of the valve seats and close one or the other of the opposed ports, a compression spring between the ball valve and the wall of the valve chamber around the expiration port and urging the ball valve away from the expiration port seat, and the valve mechanism having means providing for connection of a source of pressurized inspiration gas and for directing such pressurized gas to the inspiration port, the ball valve being movable away from the inspiration valve seat under the influence of the pressurized gas, and said spring being deflectable sufficiently to provide for engagement of the ball valve with the expiration port seat and thus close the expiration port, the expiration port being centrally located at one end of said chamber and having a cross sectional area substantially smaller than the inspiration port thereby tending to retain the ball valve in a position spaced from the expiration port during selected flows of inspiration gas from a pressurized source thereof connected with the valve mechanism, and the spring being a helical coil spring having an inside diameter at least as large as the expiration port and having one end seated against the end of the valve chamber in an area surrounding the expiration port and the other end presented for engagement with the ball valve, and the motion of the light weight ball valve in said valve chamber being unguided except for the action of said spring and of the gas flow through the valve chamber.

4,037,596

PARENTERAL ADMINISTRATION SET WITH INTERNAL VALVE AND FLOW RESTRICTOR

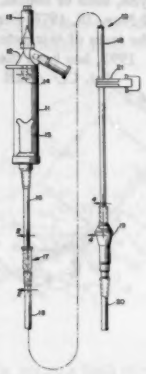
Robert J. LeFevre; George K. Burke, and Kenneth Raines, all of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Dec. 3, 1975, Ser. No. 637,209

Int. Cl.[2] A61M *5/16*

U.S. Cl. 128—214 C 14 Claims

1. A parenteral administration set comprising: a drip chamber having means thereon for connection with a source of fluid to be administered and having orifice means for forming drops of fluid flowng from the drip chamber; a length of flexible tubing connected with the drip chamber; valve means having movable means therein and in fluid communication with the interior of the length of tubing and operable between open and closed positions from exteriorly of the tubing to obtain a desired drip rate and thus control flow through the set; a needle adaptor connected with the tubing at its opposite end for receiving flow from the valve means; and fixed restrictor means in the tubing separate from the valve means and having an internal bore with a predetermined length and diameter sized to impart restriction to flow therethrough approximating the restriction to flow imposed by a needle of no larger than



about 20 or 21 gauge, to insure that the rate of drop formation is such that only one drop will form and fall for each opening cycle of the valve means during normal operation, regardless of the size of needle connected to the needle adapter.

4,037,597

DRIP CHAMBER FOR INFUSION AND TRANSFUSION APPARATUS FORMED OF SEVERAL PARTS

Hans-Jürgen Forberg, Lensahn, Holst, Germany, assignor to Firma Transcodan Sven Husted-Anderson, Germany

Filed July 3, 1975, Ser. No. 592,881

Claims priority, application Germany, July 3, 1974, 2331946; Mar. 5, 1975, 2509484

Int. Cl.[2] A61M *5/16*

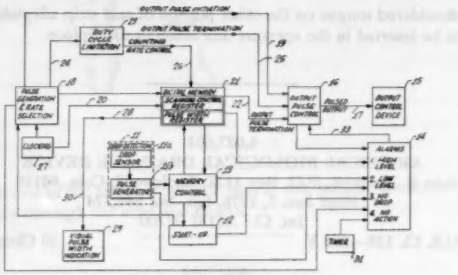
U.S. Cl. 128—214 C 13 Claims

1. In a drip chamber for infusion and transfusion apparatus formed of separate parts joined together at junctions, with one end part having a liquid duct communicating therewith and terminating in a piercing needle and another end part having a hose communicating therewith, the improvement comprising, in combination, interengageable clampingly interlocking packing components, on the adjacent edges of the parts at said junctions, telescopingly interengageably by movement of the adjacent ends toward each other and forming, when interengaged, a labyrinth packing including a plurality of sealingly interengaged sealing surfaces, whereby liquid-tight seals are formed at said junctions; the two parts joined together at a junction being provided with interlocking components which are hooked over each other, the interlocking components having bevelled surfaces which interengage with each other during assembly of the two parts.

4,037,598
METHOD AND APPARATUS FOR FLUID FLOW CONTROL

Heinz W. Georgi, Del Mar, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Aug. 12, 1974, Ser. No. 496,553
Int. Cl.[2] A61M 5/14
U.S. Cl. 128—214 E 102 Claims



1. In a system for parenteral administration of liquids at desired drop flow rates through a feeding tube from a liquid source to a patient, the combination comprising:

electromechanical output control means for manipulating the feeding tube to vary the flow of liquid in the feeding tube;

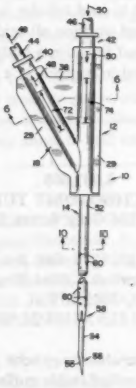
electrical pulsing means for providing output pulses to operate said output control means, said output control means being active during the periods between said output pulses in a pulse train, said output pulses being at a substantially higher frequency than the desired drop flow rate frequency; and

digital memory and timing means for automatically predetermining and varying the pulse width of said output pulses operating said control means, to achieve the desired drop flow rate.

4,037,599
CONTINUOUS FLOW CATHETER DEVICE

James D. Raulerson, Rte. 2, Box 104, Alachua, Fla. 32615

Filed Jan. 26, 1976, Ser. No. 652,288
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 17 Claims

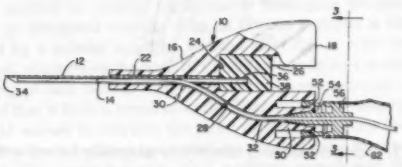


1. A catheter device for the catherization of predetermined blood vessels required during hemodialysis, said catheter device comprising: a hub means including at least two fluid conduits disposed in spaced, separated relation to one another; tube means connected to said hub means and including at least an inner tube element and an outer tube element disposed in concentric relation to one another, each of said tube elements connected in fluid communicating relation to one of said two fluid conduits, said hub means comprising socket means formed in said hub means, mounting means formed on said tube means and comprising at least in part a substantially corresponding configuration as said socket means; said mounting means disposed in mounted engagement with said socket means on the interior of said hub means; a first path of fluid flow defined by the interconnected outer tube of one of said fluid conduits; a second fluid flow path defined by the interconnected inner tube element and the other of said fluid conduits, said first and second fluid flow paths disposed in segregated relation to one another; said first and second fluid flow paths interconnected to a continuous negative and positive source of fluid pressure, whereby a continuous flow of blood simultaneously travels from and to the predetermined blood vessel upon activation of the positive and negative source of fluid flow.

4,037,600
CATHETER PLACEMENT SYSTEM

Mark P. Poncy; George W. Poncy, and Richard P. Poncy, all of 3670 E. Indus. Way, Riviera Beach, Fla. 33404

Filed July 11, 1975, Ser. No. 595,014
Int. Cl.[2] A61M 5/00, 25/00
U.S. Cl. 128—214.4 13 Claims



1. Catheter placement apparatus comprising:

a body member with front and rear ends having a linear guiding passage extending longitudinally therein and a smoothly curved guiding passage merging with said linear guiding passage within said body member and opening through the rear end of said body member in essentially parallel relationship to said linear guiding passage;

a venipuncture needle slidable received in said linear guiding passage, said needle having a puncture point at one end projecting from said body member at the front end and a hub block fixed at the opposite end of said needle;

an insertion catheter positioned in said curved guiding passage and being normally slidable through said curved guiding passage and into said linear guiding passage.

4,037,601
PROCESS FOR PREPARING STERILIZED FEMININE HYGIENE ARTICLES OF NON-WOVEN AND WOVEN TEXTURES

Marian C. Denkinger, 88-35 Elmhurst Ave., Elmhurst, N.Y. 11373

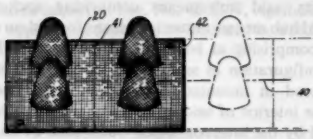
Filed Apr. 30, 1976, Ser. No. 681,798
Int. Cl.[2] A61F 13/00, 5/46
U.S. Cl. 128—285 4 Claims

1. A feminine hygiene product for digital insertion into the vaginal canal having the following characteristics:

a fundamentally hollow form defined by an outer convex surface of fibrous absorbent textile material, an inner surface formed of a film of a material selected from the group consisting of hot melt adhesive, rubber latex, synthetic plastisol latex and starch,

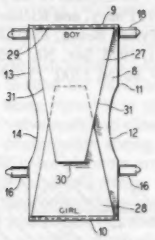
said film being adhered to and received in its outer convex surface, fibers of said textile material,

thereby to give said product a unitary conical form defining



a flexible digital receiving liner and an exterior fibrous surface for vaginal conal contact.

4,037,602
ADAPTABLE DIAPER
Janet R. Hawthorne, 556 Riford Road, Neenah, Wis. 54956
Filed Feb. 26, 1976, Ser. No. 661,449
Int. Cl.[2] A16F *13/16*
U.S. Cl. 128—287 **10 Claims**



1. A diaper assembly selectively adaptable for use with a boy or a girl, including

a planar diaper material having opposite sides and ends, an inside end and outside end,

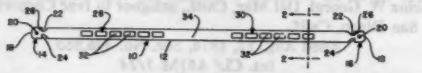
a first tapered absorbent liner on the inside of the diaper material. said first tapered absorbent liner having a base, an oppositely smaller end and tapering sides connecting the base and smaller end, said liner base being attached by releasable attaching means to a diaper material end, and the smaller end extending beyond the mid-point between the opposite diaper material ends, and

a second tapered absorbent liner having a base, an oppositely smaller end and tapering sides, the liner base of said second liner being attached at the other of the diaper material ends by a second releasable attaching means, said tapered end of the second tapered absorbent liner extending beyond the mid-point between the opposite diaper material ends and being in overlapping relationship with the smaller end of the first tapered absorbent liner,

whereby one of said liners may be removed at its base by releasing the attaching means so that the remaining liner may be selectively positioned relative to a boy or a girl, and the removed liner may be layered with the remaining liner to thicken the selected liner position.

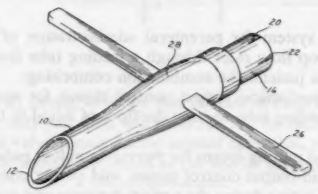
4,037,603
METALLIC SURGICAL SUTURE
Erwin R. Wendorff, 1303 Garden Lane, Reading, Pa. 19602
Filed May 13, 1975, Ser. No. 576,960
Int. Cl.[2] A61B *17/04*
U.S. Cl. 128—335.5 **5 Claims**

1. A surgical suture for employment in a looped condition with end portions of said suture in lapping relationship, said suture comprising a thin, narrow, flexible metallic strip of surgical steel, and there are means for interlocking each end of said suture to selected portions along said strip when said end portions are in lapping relationship, said means for interlocking being a series of apertures along a portion of said strip and a



shouldered tongue on the other portion of said strip adaptable to be inserted in the aperture and maintained in place.

4,037,604
ARTIFICAL BIOLOGICAL DRAINAGE DEVICE
John B. Newkirk, P.O. Box 1128, Englewood, Colo. 80110
Filed Jan. 5, 1976, Ser. No. 646,574
Int. Cl.[2] A61M *27/00*
U.S. Cl. 128—350 V **10 Claims**



1. An artificial biological drainage device such as an eye shunt, comprising:

a. a plastic, body innocuous tubular body being sufficiently rigid to maintain its shape on being implanted in a human body and having two open ends;

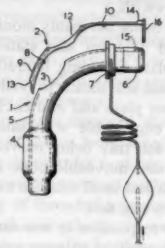
b. a soft, flexible tube contacting and peripherally secured to and telescoped over one end of said tubular body and having a soft, resilient closure forming a closed end for said tubular body, there being at least one slit in said closed end arranged to open outwardly providing a unidirectional valve for fluid above a predetermined pressure and arranged to close at a pressure slightly less than the opening pressure for maintaining fluid pressure in an eye at a generally predetermined level; and

c. a crossarm secured to said tubular body for securing the same in an implanted position all said parts being innocuous to the tissues and fluids in a body and being of a size to be accommodated in implant in a small organ.

4,037,605
TRACHEOTOMY TUBE
Bernard Charles Firth, 114 Grey Street, East Melbourne, Victoria 3002, Australia
Filed Apr. 13, 1976, Ser. No. 676,588
Claims priority, application United Kingdom, Aug. 14, 1975, 15148/75; June 19, 1975, 26058/75
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—351 **9 Claims**

3. In combination, a tracheotomy tube and removable insert means, the tube having an inflatable cuffed end for insertion in a patient's trachea, an opposite end for releasable connection to a ventilator and an aperture in the wall of the tube intermediate its ends, the removable insert means cooperating with the tube to engage and seal the aperture in an airtight fit, said insert means being such as to provide a minimum change and obstruction in the bore of the tube whereby, in use, with the cuff

inflated and said insert means in sealing engagement with the aperture a patient can be ventilated by the ventilator and upon



removal of the insert means the patient can breathe spontaneously through the nose and mouth.

4,037,606

WOMAN'S CORRECTING GARMENT

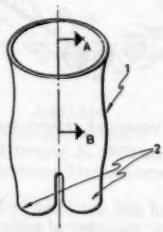
Jose Maria Masso Remiro, Barcelona, Spain, assignor to Turbo, S.A., Barcelona, Spain

Filed Nov. 20, 1975, Ser. No. 633,722

Claims priority, application Spain, Nov. 25, 1974, 207837

Int. Cl.[2] A41C *1/00*

U.S. Cl. 128—547 **2 Claims**



1. A correcting garment, comprising a tubular body adapted to cover an anatomical region below the wearer's chest, said tubular body being consituted by superimposed inner and outer tubular sheets of fabric joined together by a layer of latex therebetween, said tubular sheets being elastic in the transverse direction, and each sheet having a tendency to undergo longitudinal rolling when it is subjected to transverse stretching, one sheet tending to roll towards the interior of the garment while the other sheet tends to roll towards the exterior thereof, whereby the tendency of said one sheet to roll neutralizes the tendency of said other sheet to roll and vice versa.

4,037,607

CIGARETTE AND FILTER FOR TOBACCO SMOKE

Harold Grossman, Upper Montclair, N.J., assignor to Montclair Research Corporation, Silver Spring, Md.

Continuation of Ser. No. 479,103, June 13, 1974, abandoned. This application July 20, 1976, Ser. No. 707,073

Int. Cl.[2] A24D *1/06*; A15B *15/02*

U.S. Cl. 131—10 R **24 Claims**

1. In combination, a body of divided tobacco to be burned, a filter for the tobacco smoke resulting from the burning, the tobacco having a deposit thereon of particles of a water-insoluble, hydrophobic, moisture-laden, negative charge-imparting substance which releases moisture upon the burning of the tobacco, the filter comprising a porous substrate having a deposit thereon of particles of a positively charged, water-insoluble, hydrophobic, oleophilic, coalescing agent adapted to attract and neutralize the negatively charged particles dispersed in tobacco smoke.

4,037,608

METHOD AND APPARATUS FOR PRODUCING CIGARETTES WITH DENSE ENDS

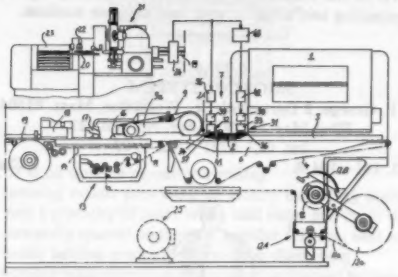
Günter Wahle, Reinbek, Germany, assignor to Hauni-Werke Körber & Co., KG, Hamburg, Germany

Filed Aug. 29, 1975, Ser. No. 609,151

Claims priority, application Germany, Sept. 11, 1974, 2443551

Int. Cl.[2] A24B *7/14*; A24C *5/18*

U.S. Cl. 131—21 B **19 Claims**



1. A method of making cigarettes or analogous smokers' wherin an elongated rod-like filler of fibrous material is surrounded by a tubular wrapper and the filler has at least one dense end, comprising the steps of forming a continuous stream consisting of said fibrous material and containing material in excess of that which is required in the filler; removing material from said stream to convert the latter into a continuous rod-like filler wherein spaced-apart portions contain more material than the filler parts between such portions; monitoring the quantity of material in said spaced-apart portions; and varying the amounts of material which are removed from those portions of the stream which correspond to said spaced-apart portions independently of the quantity of material in said filler parts when the monitored quantities deviate from a predetermined quantity.

4,037,609

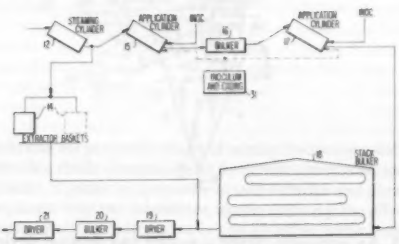
PROCESS FOR REDUCTION OF NICOTINE CONTENT OF TOBACCO BY MICROBIAL TREATMENT

Richard P. Newton, Louisville, Ky.; Vernon L. Geiss, Floyd Knobs, Ind.; John N. Jewell, and Lawrence E. Gravely, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 17, 1975, Ser. No. 632,863

Int. Cl.[2] A24B *15/02, 15/04, 3/12*

U.S. Cl. 131—141 **7 Claims**



1. In a process for reducing the nicotine content of tobacco including the steps of:

a. contacting said tobacco with an aqueous medium containing at least 1×10^7 cells per gram based on the dry weight of said tobacco of a microorganism which degrades nicotine through a biochemical mechanism in which 3-succinoylpyridine is formed; and

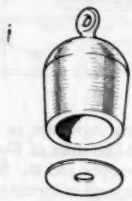
b. maintaining said tobacco in contact with said microorganism for from about 1 to about 10 hours at a moisture level of at least 50% by weight based on the total weight of tobacco and water, a temperature of from about 20° C to about 45° C, and an initial pH of from about 5 to about 8; the improvement comprising subjecting said tobacco to steam for a sufficient period of time to bring the moisture level of the tobacco to at least 15% by weight prior to contacting said tobacco with said aqueous medium.

4,037,610

SMOKING SYSTEM

Philip F. George, 2 Dartmouth St., Worcester, Mass. 01604

Filed May 21, 1976, Ser. No. 688,622
Int. Cl.² A24F *3/02, 9/02*
U.S. Cl. 131—184 A **7 Claims**



1. Smoking system, comprising

a. a pipe havng a bowl adapted to receive tobacco, the bowl having a substantially cylindrical inner surface, and

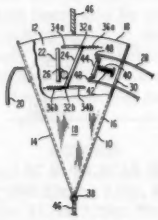
b. a tamper having a holding portion and having a tubular portion extending from the holding portion, the tubular portion having an outer surface adapted to fit snugly into the said inner surface of the bowl, the tubular portion having a relatively thin wall, so that the tamper acts to compress the tobacco only adjacent the said inner surface of the bowl.

4,037,611

AUTOMATIC CIGARETTE SNUFFER AND DISPOSAL DEVICE

Andrew P. Holland, 281 W. Mechanic St., New Hope, Pa. 18938

Filed May 10, 1976, Ser. No. 684,521
Int. Cl.² A24F *13/18, 19/14*
U.S. Cl. 131—237 **15 Claims**



1. An automatic cigarette snuffer and disposal device comprising:

a. a moveable ashtray enclosure having an open upper area, said enclosure including a front wall, a rear wall and two side walls, said enclosure being selectively moveable between a closed and an opened position said side walls defining slot means therein;

b. a stationary crusher plate fixedly mounted to said enclosure to be moveable therewith;

c. a moveable crusher plate being moveably mounted to said enclosure and positioned adjacent said stationary plate said moveable crusher plate including laterally disposed pins extending through said slot means to facilitate movement between said crusher plate and said enclosure;

d. cam means selectively engageable with said moveable plate responsive to said ash tray being moved toward a closed position to urge said moveable plate against said stationary plate and crush and snuff tobacco materials and the like located therebetween; and

e. disposal means operable responsive to movement of said enclosure to the opened position to urge said moveable crusher plate away from said stationary crusher plate to release crushed tobacco materials from between said plates for disposal therebelow.

4,037,612

WAVE ROD SYSTEM

Vernon Dale Ferrier, 5241 Pleasant Ave., Fairfield, Ohio 45014

Filed May 21, 1976, Ser. No. 688,682
Int. Cl.² A45D *2/00*
U.S. Cl. 132—31 R **18 Claims**

1. An improved wave rod system, comprising in combination:

a. a spool;

b. a locking arm;

c. a bore in one of said spool and locking arm;

d. a stub affixed to the other of said spool and locking arm and adapted to be lockingly received in said bore;

e. means to couple said bore and said stub so as to prevent relative rotation between said spool and said arm; and

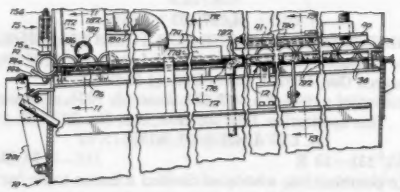
f. means to axially retain said stub in said bore.

4,037,613

WASHER FOR BEARING RACES

Jack P. Elliott, Amherst, N.Y., assignor to J. P. Elliott Associates, Inc., Buffalo, N.Y.

Filed Sept. 8, 1975, Ser. No. 610,934
Int. Cl.² B08B *3/02, 9/00;* **B60S** *3/00*
U.S. Cl. 134—83 **9 Claims**



1. A bearing washing machine comprising:

a housing having track means for carrying bearing race means through a cleaning operation and said track means being substantially stationary during said cleaning operation wherein bearing race means roll along the longitudinal length of said track means, said track means compris-

ing two spaced, substantially parallel support tracks providing a rolling support surface to each side of a bearing race means,

support track mounting means on which said support tracks are correspondingly mounted, at least one of said support track mounting means being selectively spaced from the other so as to vary the spacing of said support tracks in order to provide a rolling support surface to race means of different thicknesses,

guide rail means disposed above said support tracks, said guide rail means being selectively spaced from said support tracks in order to retain race means of different diameters in rolling contact with said support tracks,

a plurality of threaded support track mounting means shafts on which said selectively spaced support track mounting means is respectively disposed and support track mounting means linkage for interconnecting and simultaneously adjusting said support track mounting means shafts so as to selectively vary the spacing between said support track mounting means,

guide rail means linkage for adjusting the spacing of said guide rail means from said support tracks to positions of substantially equal spacing from said support tracks along the longitudinal length of said guide rail means, and

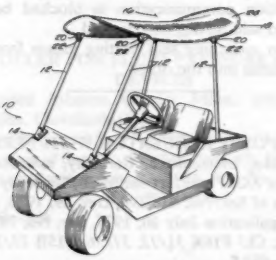
a plurality of cleaning nozzles being disposed adjacent to said track means, said cleaning nozzles being disposed for directing a corresponding plurality of selected fluid flows onto the bearing race means for the cleaning thereof in successive stages upon rolling of each bearing race means past said cleaning nozzles.

4,037,614

VEHICLE CANOPY

Charles E. Hines, and Dwight E. Williams, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 17, 1976, Ser. No. 658,593
Int. Cl.[2] B62D *25/06*; A47C *29/00*
U.S. Cl. 135—5 A **9 Claims**



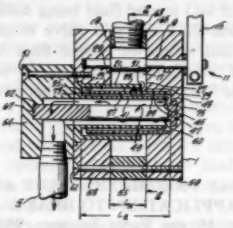
1. A canopy for a vehicle, which canopy is adapted for mounting on a plurality of upstanding support posts carried by the vehicle, said canopy comprising bracket means adapted for mounting said canopy on the support posts, a resilient perimeter frame supported by said bracket means and including opposed arcuate end sections which, in their free form, extend generally horizontally in outwardly bowed relation to each other, a flexible, water-repellent top, and means mounting said top on said perimeter frame so as to distort said end sections upwardly from their free form and cause said end sections, in attempting to return to their free form, to apply multi-directional tensions on said top such that said top assumes a generally upwardly convex shape in cross section.

4,037,615

FLUID CONTROL VALVE

Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.

Continuation-in-part of Ser. No. 519,606, Oct. 31, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 623,120
Int. Cl.[2] F16K *47/08*
U.S. Cl. 137—1 **16 Claims**



1. A fluid control means comprising

a housing means providing an axially extending outer wall and a plurality of inner walls, said outer and inner walls in inwardly spaced concentric annular relation, said annular walls having gradually decreasing diameters;

a housing inlet open to an outer annulus formed between said outer wall and the inner wall next adjacent said outer wall;

means for dissipating fluid flow energy having a valve nozzle means for introducing and tangentially accelerating varying amounts of fluid into said outer annulus and tangential to said outer wall and a means for directing and further tangentially accelerating said fluid having passed through said outer annulus through the series of annuli formed by said inwardly spaced concentric inner walls; and

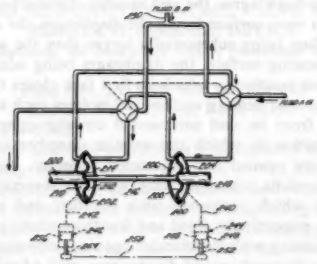
an annular exit being formed by the innermost wall and the next adjacent inner wall.

4,037,616

PROPORTIONING FLUIDS

Harry Pinkerton, Bridle Path Lane, Mill Neck, N.Y. 11765

Continuation-in-part of Ser. No. 590,897, June 27, 1975, abandoned. This application May 12, 1976, Ser. No. 685,564
Int. Cl.[2] G05D *11/03*
U.S. Cl. 137—99 **44 Claims**



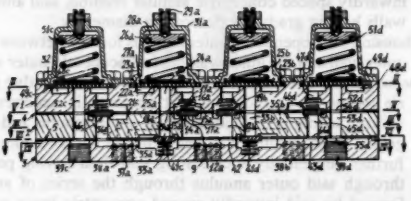
1. Apparatus for proportioning and mixing two substantially incompressible fluids comprising an hydraulic circuits including a cylinder, a piston reciprocable in said cylinder and dividing the cylinder into two chambers, means reducing the effective volume swept by said piston in one chamber to be lesser than that swept by said piston in the other chamber, first conduit means constituting an inlet for a first fluid to said one chamber and connectable to a source of said first fluid, second conduit means connecting said one chamber to said other

chamber, third conduit means connected to said other chamber and constituting an outlet for mixed fluids, fourth conduit means constituting an inlet for a second fluid and connectable between a source of a second fluid and said second conduit means to cause said second fluid to be added to said first fluid in said second conduit means in an amount directly related to the differences in effective volumes swept by said piston, and interconnected valve means cooperating in said conduit means to permit controlled reciprocation of said piston in said cylinder, said source of said second fluid being different from said source of said first fluid and said valve means constituting means isolating said source of second fluid from both said chambers as said one chamber expands and connecting said source of said first fluid to said one chamber as said one chamber expands.

4,037,617
MULTIWAY PNEUMATIC VALVE AND ITS APPLICATION TO BRAKE

Fernando Perales, 15, rue Roger Salengro, 95230 Soisy-sous-Montmorency, France

Filed Dec. 4, 1975, Ser. No. 637,502
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—118 **5 Claims**

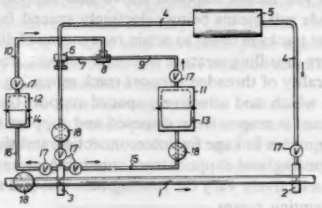


1. A fluid feeding system for feeding a fluid under different pressures to first and second outlets, said feeding system including a fluid supply inlet; first and second conduits communicating with the fluid supply inlet; first and second check valve means respectively mounted in the first and second conduits for controlling the flow of fluid therein; first and second diaphragms each having first and second faces, means cooperating with the first face of the respective diaphragms, said means forming a circular opening, an annular bearing surface surrounding said opening and an annular chamber surrounding said annular bearing surface; adjustable spring means respectively cooperating with the second faces of the respective diaphragms, the said annular chambers each having an annular open surface facing the diaphragm, the area of said open surface being substantially larger than the area of said annular bearing surface, the diaphragm being adapted to assume a rest position in which its first face closes the opening and the annular bearing surface and isolates each said annular chamber from its said surrounded circular opening, and a raised position in which the annular chamber and circular opening are opened and connected together, said first and second conduits communicating with the respective annular chambers which cooperate with the first and second diaphragms, respectively, third and fourth conduits respectively communicating with the circular openings downstream of the respective first and second diaphragms, each of said third and fourth conduits having an outlet to a closed tank, and a bypass bypassing said closed tanks comprising each of said third and fourth conduits forming a chamber having therein a seat and an annular bearing surface surrounding the conduit, third and fourth valve means each comprising a diaphragm made of resilient material, a flap valve cut from said diaphragm and engaging the bearing surface, and spring means supported on said seat and engaging the flap valve, said third and fourth conduits communicating through said third and fourth valve means with auxiliary tank means.

4,037,618
APPARATUS FOR MIXING FRICTION-REDUCING ADDITIVE TO WATER

Anton Kresser, Wedel, Holstein, and Jens Bastein, Friedrichstadt, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 4, 1974, Ser. No. 439,299
Claims priority, application Germany, Feb. 3, 1973, 2305376
Int. Cl.[2] F16K *19/00*
U.S. Cl. 137—266 **12 Claims**



1. An apparatus for mixing a friction-reducing additive to water, comprising in combination:

a. a first supply line for defining a flow path for a water stream;

b. a mixing nozzle coupled to said first supply line and being disposed in said flow path;

c. a vessel for accommodating a friction-reducing additive;

d. a second supply line connecting said mixing nozzle to said vessel, said second supply line defining a flow path for the friction-reducing additive;

e. a third supply line connected to said second supply line between said vessel and said mixing nozzle, said third supply line defining a flow path for a buffer liquid;

f. routing means coupled to said second and third supply lines, said routing means having a first position in which communication is maintained between said vessel and said mixing nozzle for introducing, by means of said mixing nozzle, the friction-reducing additive to the water stream flowing in said first supply line, in said first position communication is blocked between said third supply line and said second supply line, said routing means having a second position in which communication is maintained between said second and third supply lines for introducing the buffer liquid into said second supply line, in said second position communication is blocked between said vessel and said mixing nozzle; and

g. means for switching said routing means from one of its said positions into the other.

4,037,619
THREE-POINT REGULATOR WITH FEEDBACK

Norbert Jeschke, Dietzenbach, Germany, assignor to Samson Apparatebau AG, Frankfurt am Main, Germany

Continuation of Ser. No. 410,390, Oct. 29, 1973, abandoned.
This application July 20, 1976, Ser. No. 707,771
Int. Cl.[2] F16K *31/12, 31/36*; F15B *13/16*
U.S. Cl. 137—492.5 **4 Claims**

1. A pneumatic regulator of the three-point type for regulating a flow of fluid, comprising:

adjustable valve means for controlling the flow of fluid;

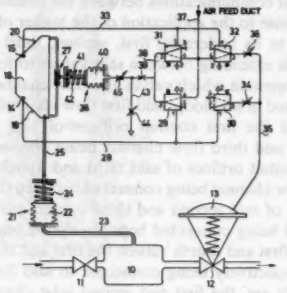
means for controlling said adjustable valve means to maintain a predetermined fluid pressure in a pressure container connected in the fluid flow path, including first and second pneumatically-operated switches and a vane mounted therebetween to be movable from a neutral position, whereby movement of said vane in a first direction respectively opens and closes said first and second pneumatically-operated switches and movement in a second direction respectively closes and opens said first and second pneumatically-operated switches;

said adjustable valve means increasing the fluid flow in

response to said first pneumatically-operated witch being opened and decreasing the fluid flow in response to said second pneumatically-operated switch being opened;

means for moving said vane in said first and second directions respectively in accordance with an increasing and decreasing pressure in said pressure container;

feedback means responsive to said first or said second pneumatically-operated switch for moving said vane in a direction to close either said first or said second pneumatically-operated switch, whereby the distance said vane moves in either said first or said second direction to open or close said first and second pneumatically-operated switches is increased;



said feedback means includes a stationary bellows and means for biasing and bellows in a neutral position, first and second microswitches respectively connected to said first and second pneumatically-operated switches and both said first and second microswitches being connected to said statinary bellows, and means for relieving the pressure within said stationary bellows;

feed duct means for supplying air to said first and second microswitches; and

said means for relieving includes a pre-choke valve connected to said first and second microswitches and to a first adjustable choke valve connected to said stationary bellows, and further including a second adjustable choke valve connected between said pre-choke valve and said first adjustable choke valve and open to the atmosphere.

4,037,620

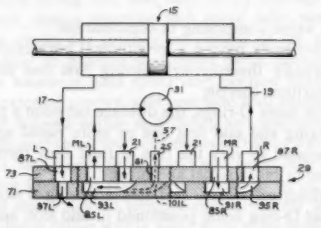
CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES

Oliver Wendell Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 679,607, April 23, 1976, which is a continuation of Ser. No. 507,015, Sept. 18, 1974, abandoned. This application June 23, 1976, Ser. No. 699,147

Int. Cl.² B62D 5/08

U.S. Cl. 137—596 **19 Claims**



1. A controller for fluid pressure operated devices, said controller comprising:

a. a housing;

b. valve means disposed in said housing including a primary, rotatable valve member and a cooperating, relatively rotatable follow-up valve member, said valve members defining a neutral position relative to each other and having generally coincidental axes of rotation;

c. means coupling said follow-up valve member to said primary valve member for limited movement relative to said neutral position and for common rotary movement therewith;

d. a fluid meter including a metering member movable to measure the volume of fluid which passes therethrough;

e. means coupling said metering member to said follow-up valve member for imparting follow-up movement thereto responsive to movement of said metering member;

f. said controller including an inlet port, an outlet port, first and second control fluid ports for connection to a fluid pressure operated device, and a load sensing port for connection to a means operable to vary the fluid pressure at said inlet port;

g. said primary and follow-up valve members cooperating with said housing to define a first fluid passage connecting said inlet port in fluid communication with said first control fluid port when said valve members are relatively displaced in one direction from the neutral position, said first fluid passage including said fluid meter;

h. said primary and follow-up valve members cooperating with said housing to define a second fluid passage connecting said inlet port in fluid communication with said second control fluid port when said valve members are relatively displaced in the other direction from the neutral position, said second fluid passage including said fluid meter;

i. said first and second fluid passages being constructed and arranged to provide substantially the same restriction to fluid flow between said inlet port and said first and second control fluid ports, respectively, for the same relative displacement of said valve members from the neutral position in said one and the other directions, respectively; and

j. said follow-up valve member and said housing cooperating to define a load sensing passage in continuous fluid communication with said load sensing port and disposed to communicate with said first fluid passage when said valve members are relatively displaced in said one direction and with said second fluid passage when said valve members are relatively displaced in said other direction.

4,037,621

LOAD RESPONSIVE CONTROL VALVE WITH CONSTANT LEAKAGE DEVICE

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

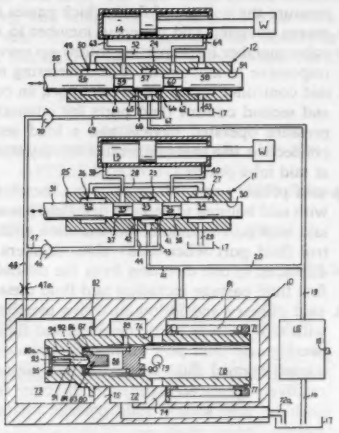
Filed Nov. 26, 1975, Ser. No. 635,416

Int. Cl.² F15B 13/042; F16K 11/00

U.S. Cl. 137—596.13 **5 Claims**

1. A valve assembly comprising a multiplicity of housings, each housing having an inlet chamber, a load chamber subjected to load pressure, an outlet chamber and exhaust means, valve bore means in each housing interconnecting said chambers and axially guiding a valve spool, load sensing port means at the region of each valve bore between said inlet chamber and said load chamber, check valve means operably connected with each of said load sensing port means to permit flow from said load sensing port means to a pressure chamber and to block reverse flow, bypass valve means interconnecting said inlet chambers and said exhaust means to maintain a constant pressure differential between said inlet chamber and said pressure chamber, said bypass valve means including a bypass spool, spring biasing means to bias said bypass spool in one direction to reduce said bypass flow, means responsive to pressure differential betwen pressure in said inlet chambers and pressure in said pressure chamber, said pressure in said pres-

sure chamber being pressure of one of said load chambers subjected to highest load pressure, to bias said bypass spool in opposite direction to increase said bypass flow and pressure responsive variable leakage means continuously interconnecting said pressure chamber and said exhaust means to increase the response of said bypass valve means in a direction to increase said bypass flow, said pressure responsive variable leakage means having variable orifice means varied by pressure in said pressure chamber and subjected to pressure in said pressure chamber said variable leakage means includes spool means



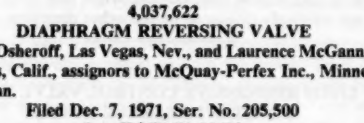
having guiding surface means guided in a bore interconnecting said pressure chamber and said exhaust means, varying flow area leakage passage means on said guiding surface means and connecting opposite ends of said spool means, spring biasing means biasing said spool means towards said pressure chamber and positioning said spool means in respect to said bore with change in pressure in said pressure chamber, said varying area leakage passage means cooperating with said interconnecting bore to produce a decrease in leakage flow in response to an increase in pressure in said pressure chamber.

4,037,622

DIAPHRAGM REVERSING VALVE

Gene W. Osheroff, Las Vegas, Nev., and Laurence McGann, Los Angeles, Calif., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Dec. 7, 1971, Ser. No. 205,500
Int. Cl.² F16K *11/10*
U.S. Cl. 137—597 **4 Claims**



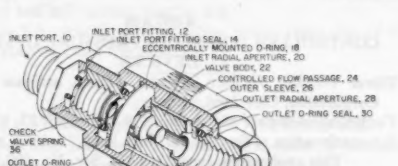
1. In a system wherein it is necessary to interconnect first and second inlet channels to first and second outlet channels in either one of two ways, namely, the first and second inlet channels to the first and second outlet channels, respectively, and the first and second inlet channels to the second and first outlet channels, respectively, connection-reversing apparatus mounted between said inlet and outlet channels and coupled to a gas-pressure source adapted to apply a pair of gas-pressure signals thereto, one signal being of higher pressure than the other, said reversing apparatus comprising: first, second, third and fourth valves respectively including first, second, third and fourth chambers and first, second, third and fourth free-floating diaphragms positioned between the rooves and floors of said chambers, the floors of said chambers each having a gas-pressure orifice therethrough and the rooves of said chambers each having first and second conduit orifices therethrough, each of said valves being open when the conduit orifices in the roof thereof are in communication with one another and closed when communications therebetween are interrupted, each of said diaphragms normally resting on the floor of its valve chamber and rising to the roof thereof to interrupt communications between the conduit orifices thereat in response to the application of the higher of the gas-pressure signals to its underside; first, second, third and fourth flow channels extending between said valves to form a closed-loop arrangement in which valves and flow channels are alternately connected in said loop, said first flow channel being connected between the first conduit orifices of said first and second valves, said third flow channel being connected between the first conduit orifices of said third and fourth valves, said second flow channel being connected between the second conduit orifices of said second and third valves, and said fourth flow channel being connected between the second conduit orifices of said first and fourth valves, the first and second outlet channels respectively being connected to said first and third flow channels and the first and second inlet channels respectively being connected to said second and fourth flow channels; and first and second pressure signal channels, said first signal channel being connected between the gas-pressure orifices of said first and third valves and said second signal channel being connected between the gas-pressure orifices of said second and fourth valves, the gas-pressure source being coupled to said first and second signal channels for applying the gas-pressure signals thereto.

4,037,623

VARIABLE O-RING CONTROL VALVE

Paul R. Beswick, 128 Topsfield Road, Ipswich, Mass. 01938

Filed Jan. 8, 1976, Ser. No. 647,364
Int. Cl.² F16K *5/10*
U.S. Cl. 137—599 **17 Claims**



1. A valve comprising in combination:

a valve body having a longitudinal bore extending at least partially therethrough having first one or more radial apertures therein;

one or more O-rings, the distance between a portion of said O-ring and said first one or more radial apertures being variable to vary the rate of fluid flow through said first one or more radial apertures;

a cylindrical sleeve, said sleeve having a slot therein, and said O-ring being positioned in said slot; and

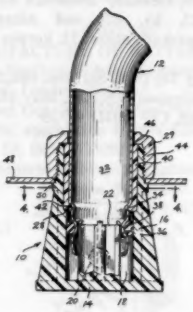
wherein said valve body is positioned within said sleeve and said slot and said O-ring extend radially around said valve body, the center of said O-ring being offset from the longitudinal axis of said valve body.

4,037,624

SPOUT ASSEMBLY

Larry G. Turner, Waterford, and Dennis W. Crawford, Pontiac, both of Mich., assignors to Bristol Products, Inc., Bristol, Ind.

Filed Mar. 1, 1976, Ser. No. 662,710
Int. Cl.[2] E03C *1/04*
U.S. Cl. 137—615 15 Claims



1. A spout assembly comprising a base having a bottom wall and a side wall, said bottom and side walls defining a cavity within said base having an open end, a fluid inlet port formed in said base and extending into said cavity, projection means carried by said base bottom wall and spaced from said base side wall, a spout having a bore therethrough with inlet and outlet end portions, said spout inlet portion fitting into said base cavity through the open end thereof and over said projection means, means securing said spout inlet portion within said base cavity for rotative movement of the spout relative to the base to position said spout outlet portion at selected angular locations, said projection means extending into said spout bore and contacting said spout inlet portion within said bore for guidably anchoring said inlet portion during said rotative movement of the spout, said projection means defining a fluid passage from said inlet port into said spout bore, said projection means including spaced ribs contacting said spout inlet portion within said spout bore, said ribs having an interstice therebetween defining said fluid passage.

9. A spout assembly comprising a base having a bottom wall and a side wall, said bottom and side walls defining a cavity within said base having an open end, a fluid inlet port formed in said base and extending into said cavity, a spout having a bore therethrough with inlet and outlet end portions, said spout inlet portion fitting into said base cavity through the open end thereof, means securing said spout inlet portion within said base cavity for rotative movement of the spout relative to the base to position said spout outlet portion at selected angular locations, said spout inlet portion having a circumferential external groove, said base side wall having an internal shoulder formed within said cavity and spaced from said base end wall, said spout securing means including a sleeve and collar means, said sleeve fitted about said spout inlet portion and including lip means seated within said spout groove for securing said sleeve against longitudinal movement along said spout, said sleeve fitting within said cavity at its open end and seated upon said base shoulder, said collar means fitted about said spout and overlying said sleeve at said cavity opening for securing said sleeve within said cavity, and means for securing said collar means to said base.

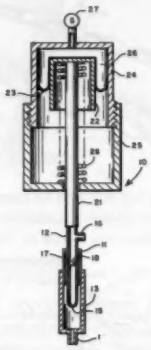
960 O.G.—60

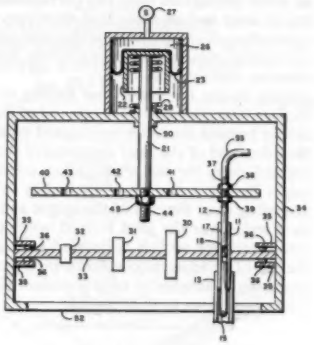
4,037,625

SLIDING TUBE FLUIDIC CONTROLLER

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1975, Ser. No. 621,183
Int. Cl.[2] F15D *1/02*
U.S. Cl. 138—46 6 Claims





1. A fluidic controller having at least two selectable throttling ranges each having a corresponding calibration point, said controller comprising:

an outer tube having a first end connectable to a source of pressure and a second end connectable to a source of reference pressure;

inner tube means extending within said outer tube for forming a restrictive passage capable of establishing a substantially linear pressure gradient therealong between said outer tube and said inner tube means, said inner tube means having a first end and a second end, said second end having an output port, said inner tube means further having an orifice for communicating said restrictive passage to said output port;

sensing means for sensing a condition;

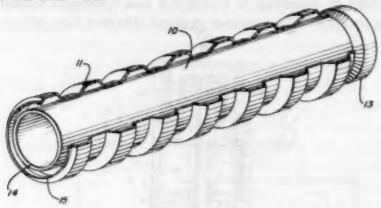
positioning means responsive to said sensing means for positioning said orifice along said passage; and,

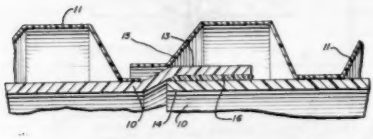
throttling range changing means for changing the throttling range of said controller without affecting the calibration point.

4,037,626
HIGH STRENGTH COMPOSITE PIPE STRUCTURE HAVING LEAKPROOF JOINTS

James E. Roberts, Jr., Canton, Ohio, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 15, 1975, Ser. No. 613,051
Int. Cl.[2] F16L 9/06, 21/00
U.S. Cl. 138—109 7 Claims





1. A leakproof, plastic composite pipe for conveying fluids comprising:

a. an outer corrugated pipe, the corrugations thereof defining an inner and an outer pipe diameter;

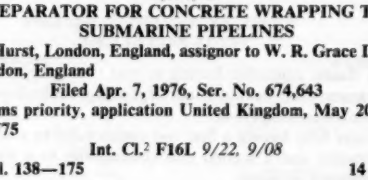
b. a smooth-walled liner fitted within and affixed to the outer corrugated pipe at the corrugations defining the inner diameter thereof; and

c. joining means for end-to-end joining of composite pipe sections comprising a bell at one end of the liner extending axially beyond the outer corrugated pipe, and a spigot at the other end of the liner coextensive with the outer corrugated pipe, the last corrugation coextensive with the spigot having a portion of the valley of the corrugation extending over the end of the spigot and adapted to slide over and cover the joint formed when the spigot of one composite pipe section is inserted into and engaged with the bell of an adjacent composite pipe section, said joining means being adapted to receive sealant means to provide a joint impervious to fluid leakage.

4,037,627
SEPARATOR FOR CONCRETE WRAPPING TO SUBMARINE PIPELINES

John Hurst, London, England, assignor to W. R. Grace Limited, London, England

Filed Apr. 7, 1976, Ser. No. 674,643
Claims priority, application United Kingdom, May 20, 1975, 21596/75
Int. Cl.[2] F16L 9/22, 9/08
U.S. Cl. 138—175 14 Claims

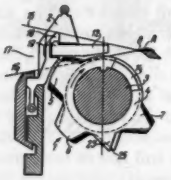


14. A pipe having a concrete cladding sprayed thereon in discrete sections separated by spacers, each spacer comprising in combination a base flange having opposed sides, a web extending generally perpendicularly from the base flange from one said side, the cross-section of the spacer being generally T-shaped, the spacer being flexible, the web being compressible and the web being at least as resistant to bending adjacent the base flange as at positions remote from the base flange.

4,037,628
TRAVELLING-WAVE LOOM

Jury Ivanovich Komarov, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 215; Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49; Gennady Ivanovich Kovalev, Kronshtadtsky bulvar, 27, kv. 85, and Alexei Pimenovich Mshvenieradze, Amurskaya ulitsa, 22, korpus 2, kv. 78, all of Moscow, U.S.S.R.

Filed May 13, 1976, Ser. No. 686,257
Claims priority, application U.S.S.R., May 15, 1975, 2134358
Int. Cl.[2] D03D 47/26
U.S. Cl. 139—436 6 Claims

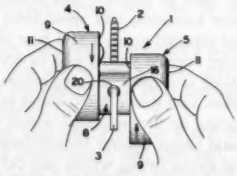


1. In a travelling-wave loom having a plurality of weft thread carriers, a rotary shaft; disks fixed to said shaft for rotation therewith; said disks forming groups each including at least two disks, said disks having teeth of different radial lengths arranged in increasing order of radial length in the direction of rotation, said disk teeth having front edges and said disks being angularly offset relative to one another with said teeth thereof forming parts of helicoids, one of said teeth of each disk engaging the weft thread as soon as the latter emerges from the weft thread carriers, at least one of the teeth of a disk of each group being located relative to the corresponding tooth of the other disk of each group in such a way that a helical line formed by front edges of these teeth has steps.

4,037,629
PORTABLE CRIMPING DEVICE

Vern J. Hively, 3640 Mountview Drive, Alliance, Ohio 44601

Filed Dec. 6, 1976, Ser. No. 747,690
Int. Cl.[2] B21D 13/04
U.S. Cl. 140—106 8 Claims



1. A portable device for crimping a metal strip including:

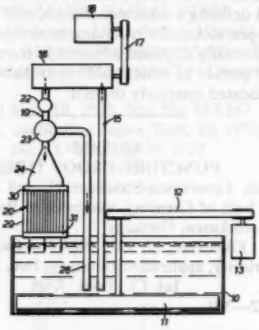
a. a pair of spaced knob means;
b. gear means mounted on each knob means and extending outwardly therefrom, with said gear means being in meshing engagement with each other upon rotation of at least one of the knob means;
c. collar means located between the knob means and surrounding the meshing gear means;
d. opening means formed in the collar means for inserting and discharging a metal strip which is crimped by the meshing gear means when fed between said gear means upon rotation of said knob means.

4,037,630

MANUFACTURE OF BATTERY PLATES

Stanley Charles Foulkes, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Oct. 20, 1975, Ser. No. 623,897
Claims priority, application United Kingdom, Oct. 18, 1974, 45241/74; Dec. 23, 1974, 55500/74
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.² H01M 4/82
U.S. Cl. 141—1.1 **30 Claims**



1. A method for preparing enveloped plates for batteries by introducing an active material composition containing liquids into the porous envelope of the plate, when the envelope is assembled on the current conducting element of the plate, characterized in that the active material of the composition is introduced into the envelope as an aqueous slurry, comprising a lead acid active material composition, which has a rotating vane viscometer torque value of less than 0.006 lbs. ft. at 20° C, said aqueous slurry being introduced into the envelope at a pressure of less than 5 p.s.i. until the envelope is filled with the composition, liquid issuing through the walls of the envelope, the pressure then being allowed to rise to a value above 5 p.s.i. but not in excess of 100 p.s.i. whereafter the pressure is released.

4,037,631

METHOD OF CHARGING A CRYOGENIC PROBE

Robert R. Schulze, 4116 - 73rd Place, Des Moines, Iowa 50322, and Floyd R. Ladd, West Des Moines, Iowa, assignors to by said Floyd R. Ladd said Robert B. Schulze, Des Moines, Iowa 50265

Division of Ser. No. 570,723, April 23, 1975. This application Feb. 9, 1976, Ser. No. 656,350
Int. Cl.² B65B 3/10
U.S. Cl. 141—2 **1 Claim**

1. The method of charging a cryogenic probe having a movable valve means closing the lower end of an interior compartment, comprising
placing the cryogenic probe in a container having a cryogenic liquid therein,
removing the cryogenic probe from the container to permit the probe to warm slightly,
inserting the probe into the container so that the warmed probe causes the liquid to boil,
closing the container to the surrounding atmosphere when the probe is inserted therein,

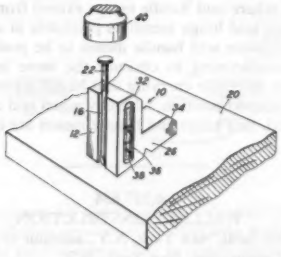
opening the valve means so that the gas pressure above said liquid within said container created by the boiling liquid will cause the liquid to move upwardly into said interior compartment,
and closing said valve means.

4,037,632

NAIL HOLDING DEVICE

Thomas Arena, 1905 Allison Drive, Bellmore, N.Y. 11710

Filed Aug. 3, 1976, Ser. No. 711,427
Int. Cl.² B25C 3/00
U.S. Cl. 145—46 **9 Claims**



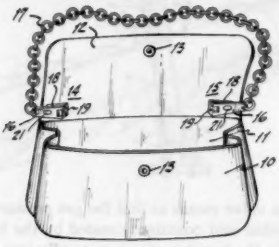
1. A nail holding device comprising a block of magnetic material formed with two sides meeting at a right angle whereby, when said block is positioned with one of said sides against a working surface, the other of said sides is arranged prependicularly with respect to said working surface; and a groove extending longitudinally the full length of said other side and so formed in said other side that, when the block is positioned as indicated, said groove extends perpendicularly with respect to said working surface whereby, when a nail made of a magnetizable material is placed in said groove, said nail is retained perpendicularly with repsect to said working surface, the length of said other side being less than the length of said nail but sufficiently long to adequately retain the nail so that initial driving of the nail straight into the working surface can be effected, said block further provided with a third side respectively meeting the outer ends of said two sides at an acute angle whereby, when said block is positioned with said third side against the working surface, initial driving of a nail retained in the groove in said other side can be effected at an angle.

4,037,633

HINGED HANDBAG HANDLE APPARATUS

Michael Gordon, New York, N.Y., assignor to Koret, Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,230
Int. Cl.[2] A45C 13/26
U.S. Cl. 150—33 10 Claims



1. A bag having an inner compartment formed between side walls, a back and a front wall and a bottom wall with an open top communicating with said compartment and a cover member for covering said open top, in combination therewith apparatus for enabling a user to carry said bag in a first and a second mode, comprising:

a. a first selectively pivotable hinge member coupled to said cover member on a right end of the inner surface and positioned to overlie said open top when said cover member is closed,

b. a second selectively pivotable hinge member coupled to said cover member on a left end of the inner surface and positioned to overlie said open top when said cover member is closed,

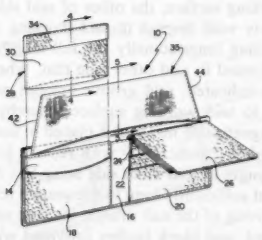
c. handle means coupled between said first and second hinge members and operative to enable said user to carry said bag during a first selectively pivotable position of said hinges where said handle means extend from and support said bag, said hinge members pivotable in a second position to enable said handle means to be positioned within said compartment to obscure the same in said second position to enable carrying said bag as a clutch apparatus in said second position, whereby when said cover member is closed, said hinge and handle means are obscured from view.

4,037,634

WALLET CONSTRUCTION

Franc M. Ricciardi, New York, N.Y., assignor to Richton International Corporation, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,776
Int. Cl.[2] A45C 1/06
U.S. Cl. 150—36 1 Claim



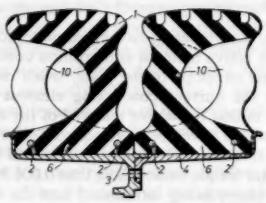
1. A wallet construction, comprising a rear panel, an intermediate panel joined to said rear panel at the ends and along bottom edges thereof and defining a large pocket therewith that extends the length of said panel and that is of a dimension for receiving paper currency therein, an intermediate overlay strip overlapping said intermediate panel at a middle portion thereof for reinforcing said intermediate panel approximately along a fold line thereof, a plurality of secondary panels at least three marginal edges of which are joined to said intermediate panel to define a plurality of parallel extending, open-ended pockets, and an interior pocket located within said large pocket and having substantially the same longitudinal dimension thereof at least along an outer longitudinal edge threof, said interior pocket having a mouth that is normally located interiorly of said large pocket so that it is not normally visible when said large pocket is exposed, wherein articles of value or currency when located in said interior pocket are secreted from view when said large pocket is exposed upon the unfolding of said wallet construction for access to one or more of the pockets located therein, an interior pocket including a first interior panel that is joined to said rear panel at the outermost edge thereof for permanently attaching said interior pocket to said rear panel, and a second interior panel joined to said first interior panel along the sides thereof and along the edge normally located adjacent to a bottom edge of said rear panel, wherein the mouth of the interior pocket is exposed when the interior panels thereof are removed from said large pocket, and a removable insert normally located in one of said open-ended pockets and defining a separator therein, said removable insert having an open mouth for receiving an article of value therein and being normally disposed adjacent to the closed end of the open-ended pocket in which said removable insert is located and being located interiorly thereof.

4,037,635

PUNCTURE-PROOF TIRES

Jakob Ippen, Leverkusen-Steinbuechel, and Friedel Stüttgen, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1975, Ser. No. 640,788
Claims priority, application Germany, Dec. 19, 1974, 2460050
Int. Cl.[2] B60C 7/08
U.S. Cl. 152—301 5 Claims



1. A vehicle tire comprising two symmetrical halves adapted to lie alongside one another when the tire is mounted on a wheel felly, a continuous tire foot adapted to contact the felly, a resilient, reinforcing connecting portion, the connecting portion comprising a plurality of supporting members having been formed by axial cut-outs and the supporting members are segment-like and alternately arranged in opposite direction, thus being orientated alternately towards the felly edge and the felly centre.

4,037,636

SAFETY PNEUMATIC TIRE

Bodo Hagenbohmer, and Philipp Schaefer, both of Hannover, Germany, assignors to Michelin Recherche et Technique, Switzerland

Filed Jan. 12, 1976, Ser. No. 648,014
Claims priority, application Germany, Jan. 14, 1975, 2501188; Nov. 4, 1975, 2549239
Int. Cl.[2] B60C 21/08, 17/00
U.S. Cl. 152—347 28 Claims

1. In a tire having an inner wall defining a tire cavity and

containing a filling material for plugging punctures, the improvement which comprises said filling material being a suspension of hollow spheres, said suspension comprising a gaseous continuous phase containing freely movable suspended

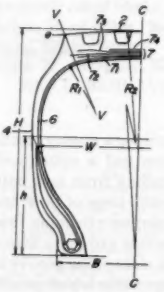
hollow spheres having thin shells consisting of synthetic material, said hollow spheres containing a gas in the centers thereof and having a diameter of from 0.01 to 0.4 millimeters and a density of from 0.005 to 0.25 g./cc., said suspension at least partially filling the tire cavity.

4,037,637

PNEUMATIC RADIAL TIRES

Iwao Arimura, Kodaira; Akio Sato, Higashi-Murayama; Hironori Hirano, Akigawa, and Shigeo Makino, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 10, 1975, Ser. No. 612,167
Claims priority, application Japan, Sept. 18, 1974, 49-106648
Int. Cl.[2] B60C *9/04, 9/18*
U.S. Cl. 152—352 R **13 Claims**



1. A pneumatic radial tire constructed to reduce breaker interlayer shearing strain, comprising: a pair of bead portions; a side portion arranged adjacent to each bead portion; an outwardly convex crown having shoulder portions connected to respective side portions, a carcass composed of at least one inextensible cord layer extending across said two bead portions and aligned in a substantially radial direction of the tire, and a breaker disposed outside said carcass in said crown and having a width substantially equal to a width of said crown, said breaker comprising at least two layers of cords having a modulus of at least 10×10^3kg/mm^2, said breaker cords being inclined a maximum of 25° with respect to the peripheral center line of the tire in different directions between said layers, said tire having an initial sectional shape which satisfies the following conditions when spaces between said bead portions are held in a normal distance before and after pressurizing said tire:

1. $R_1/R_1' \leqq 0.8$,
2. $R_2/W/R_2'/W' \geqq 1.5$,

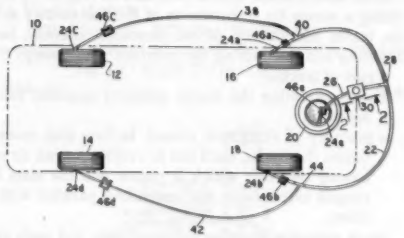
where R_1 is a radius of curvature of the outer profile of the carcass in a vertical center section through the rotational axis of the tire on a normal line to the outer curved surface through a width-wise end of said crown before the inside of the tire is pressurized, R_1' is its corresponding radius of curvature after the inside of the tire has normally been pressurized, R_2 is a radius of curvature of the outer profile of the crown in the vertical center section through the rotational axis of the tire before the inside of the tire is pressurized, R_2' is its corresponding radius of curvature after the inside of the tire has normally been pressurized, W is the maximum width of the tire in the vertical center section through the rotational axis of the tire before the inside of the tire is pressurized, and W′ is its corresponding maximum width of the tire after the inside of the tire has normally been pressurized.

4,037,638

EMERGENCY KIT FOR VEHICLE TIRES

Rudolph Mosca, 225 Varick St., New York, N.Y. 10014

Filed Dec. 23, 1975, Ser. No. 643,633
Int. Cl.[2] B60C *23/10*
U.S. Cl. 152—415 **3 Claims**



1. An emergency kit for simultaneously equlizing and increasing the inflation pressure in the four tires and in the spare tire of a motor vehicle comprising in combination:

a first length of flexible tubing having a coupling at each end thereof adapted to be sealingly connected with the inflation valves of the rear tires of a vehicle and to depress the valve stems thereof to open said inflation valves;

a second length of flexible tubing connected at one end thereof by means of a first tee coupling intermediate the ends of said first length of tubing and in open communication therewith, a coupling at the other end of said second length of tubing adaptedto be sealingly connected with the inflation valve of a spare tire and to depress the valve stem thereof to open said inflation valve;

a manually operable pump having an air inlet and an air discharge side operatively connected in said second length of flexible tubing having the discharge side thereof on the side of said tee coupling;

third and fourth lengths of flexible tubing each having a coupling at one end adapted to be sealingly connected with the inflation valves of the respective front tires of a vehicle and to depress the valve stems thereof to open said inflation valves and connected by means of second and third tee couplings to said first flexible tubing to be in open communication therewith, said second and third tee cou-

plings being interposed in said first flexible tubing between said first tee coupling and the respective ends of said first flexible tubing;

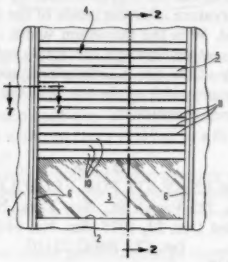
and adjustable clamp means secured to each of said lengths of tubing for selectively permitting the flow of pressurized air therethrough to and from the front and rear tires of the vehicle, said clamp means being so positioned in said lengths of tubing as not to interfere with the open communication between same even when all of said clamp means are closed.

4,037,639

THERMAL BARRIER

J. Paul Jones, 644 Valley View Lane, Wayne, Pa. 19087

Filed Nov. 8, 1976, Ser. No. 739,528
Int. Cl.[2] E06B *9/08*
U.S. Cl. 160—133 **5 Claims**



1. In combination with a structure having an aperture providing a means for transmission of thermal energy as between the inside and outside of the structure, thermal barrier for covering and uncovering the aperture comprising;

a pair of tracks,

means mounting the tracks adjacent opposite sides of the aperture;

a plurality of elongated, closed, hollow slats extending between the tracks, each slat providing a dead air space and having one side which is planar and the slats being arranged side-by-side and extending parallel with one another;

pivot means connecting adjacent slats and each pivot providing for the slats connected thereto to pivot relative to one another and for the slats to move in unison in translation in a direction generally normal to the axes of the slats;

on the opposite ends of each slat a pair of fingers, each finger extending generally parallel to the slat axis;

each said track including a first hollow compartment coextensive with the track and having an open side thru which the fingers extend into the compartment, means at the edges of the open side slideably engaging each of said fingers, a second hollow compartment co-extensive with the track and at least a portion of which extends over the ends of the slats and over portions

of the contiguous planar sides and means on the second compartment slidingly engaging the planar sides, said engagements providing for the slats to move in translation along the tracks and said engagements on the planar sides each constituting a seal minimizing passage of air therebetween;

said slats, pivots and tracks constituting thermal barrier means and movement of the slats in translation providing for the slats to be positioned to cover the aperture to reduce transmission of thermal energy thru the aperture and to be positioned to uncover the aperture to unimpede said transmission; and

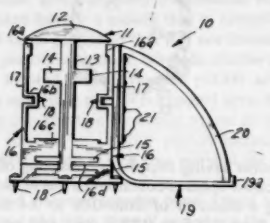
storage means for receiving said slats when the slats are positioned to uncover said aperture.

4,037,640

TAPESTRY HOLDER

Michael James Hubbard, 601 Hobson Ave., Hot Springs, Alaska 71901

Filed Dec. 26, 1974, Ser. No. 536,556
Int. Cl.[2] A47H *13/00*
U.S. Cl. 160—398 **7 Claims**



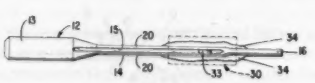
1. A tapestry holder assembly for mounting a tapestry on a supporting surface comprising at least one pressure plate means, slide bar means removably engaging said pressure plate means and having an elongated configuration extending the length of said pressure plate means, said slide bar means further comprising at least one first projection portion formed thereon and disposed in outward projection toward said pressure plate means, said pressure plate means further comprising at least one first protruding ridge portion formed thereon and disposed in outward projection toward said slide bar means, said first protruding ridge portion disposed in spaced apart and substantially adjacent over-hanging relationship to said first projection portion, whereby the tapestry is clamped between said pressure plate means and said slide bar means, retainer means slidingly and removably engaging said slide bar means and attached to the supporting surface, slide bar stabilizer means attached to said pressure plate means and disposed in resting support relation to the supporting surface.

4,037,641

METHOD OF FABRICATING SEWING MACHINE NEEDLES

Josef Zocher, Aachen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.

Filed July 16, 1976, Ser. No. 705,860
Int. Cl.[2] B21G *1/02*
U.S. Cl. 163—5 **4 Claims**

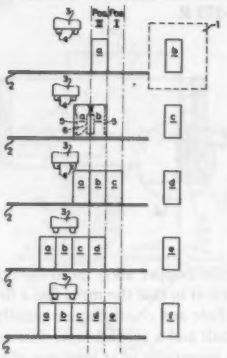


1. The method of forming a sewing machine needle having a cylindrical butt portion and a cylindrical blade portion of smaller diameter extending from said butt portion to a free extremity, comprising the steps of flow pressing a continuous groove in said blade portion extending from said butt portion to closely adjacent the free extremity thereof, shaping parallel side flanges at opposite sides of the groove in said blade portion in said flow pressing operation which parallel side flanges have a height dimension at least equal to the diameter of said cylindrical blade portion, die pressing an eye portion including an eye-accommodating web in said grooved blade portion closely adjacent to the free extremity thereof, modifying the shape of said parallel side flanges in said eye portion by said die pressing operation without reducing said height dimension, punching an eye in said eye-accommodating web, and forming a point at the free extremity of said blade portion.

4,037,642
METHOD IN THE OPERATION OF AN APPARATUS FOR PRODUCING CASTINGS

Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Aug. 27, 1975, Ser. No. 608,337
Claims priority, application Denmark, Sept. 17, 1974, 4909/74
Int. Cl.[2] B22D *33/00*
U.S. Cl. 164—18 4 Claims

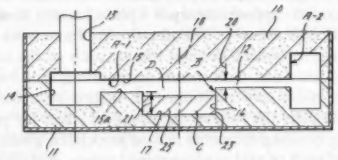


1. A method in the operation of an apparatus for producing castings in casting moulds consisting of identical mould parts which are produced successively by the compression of sand or a similar material in a pressing chamber and are from this chamber fed to a pouring track or guideway on which the casting mould is formed by the mould parts being placed closely together and advanced stepwise through a pouring station, comprising the steps of delivering said mould parts one by one to said pouring track; moving a produced mould part along said pouring track to a preselected position; moving at least one additional mould part along said track to a position upstream of said preselected position where said at least one additional mould part is placed closely together with its immediately preceding mould part to form a casting mould; and repeating said first and second moving steps in sequence so as to move said formed casting mould stepwise through the pouring station with a length of step that is a multiple of the thickness of a mould part.

4,037,643
NODULARIZING TREATMENT EMPLOYING UNITIZED MODIFYING AGENT

Prem P. Mohla, Plymouth; Adolf Hetke, Livonia, and Robert J. Warrick, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 22, 1975, Ser. No. 606,909
Int. Cl.[2] B22D *27/20*
U.S. Cl. 164—58 22 Claims



1. A method of conditioning a charge of molten cast iron which would normally solidify with a flake graphite structure immediately before casting to produce modified shape graphite cast iron castings, wherein the improvement consists of (a) recessing an impervious mass of nodularizing agent in and along a wall of gating runner system leading to a mold cavity so that the mass presents substantially a constant reaction interface surface throughout conditioning, and (b) introducing an effective amount of molten grey cast iron charge into said gating system allowing said molten charge to flow across said interface surface to progressively and uniformly dissolve said mass.

19. A molding apparatus for use in making nodular cast iron within a mold system, the apparatus comprising:

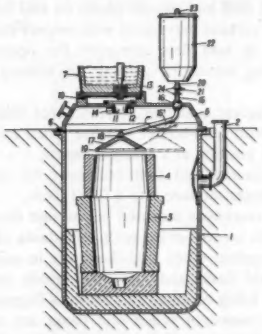
a. at least a two part refractory mold body, said body having first walls on one or both of said parts defining a molding cavity, said body having second walls on one or both of said parts defining a gating system in communication with said cavity, said body also having third walls defining one or more recesses in said second walls on or off the parting surface between said parts, said recesses having a bottom wall, side walls and an open top, said third walls providing a uniform cross-section taken in a direction normal to that portion of said second walls within which said recesses are deposed, and

b. an impervious solid mass of nodularizing agent disposed in and substantially occupying the interior of each of said recesses, said mass having an exterior surface mating with the bottom and side walls of the recess thereby presenting only an exposed top surface generally parallel to the orientation of said second wall within which said recess is disposed.

4,037,644
PROCESS FOR CASTING STEEL INGOTS UNDER A VACUUM

Rainer Tarmann, and Walter Hopf, both of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed Sept. 16, 1975, Ser. No. 613,859
Claims priority, application Austria, Sept. 23, 1974, 7609/74
Int. Cl.[2] B22D *27/16, 7/10*
U.S. Cl. 164—61 2 Claims



1. In a process of casting steel ingots which utilizes a ladle for carrying molten steel, a mould container having a lid, said lid being adapted to pass molten steel therethrough, said container capable of being evacuated, and a mold disposed within said container, said mould having a hood thereover, said process comprising the step of casting molten steel from said ladle into said mould under a vacuum, and thereafter applying an anti-piping powder onto the surface of molten steel, the improvement comprising the steps of:

maintaining said vacuum after said casting step is finished, and

introducing the anti-piping powder into said hood and applying it uniformly onto the surface of the molten steel while continuing to maintain said vacuum.

4,037,645

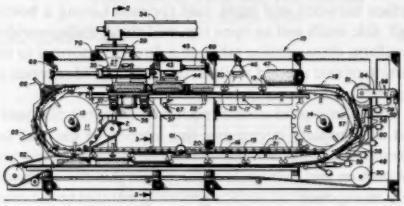
AUTOMATIC MOLD AND CORE FORMING MACHINE

William R. Kloster, Muscatine, Iowa, and Patrick H. Stewart, Danville, Ill., assignors to C L Industries, Inc., Danville, Ill.

Continuation of Ser. No. 529,902, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 445,485, Feb. 25, 1974, abandoned. This application May 21, 1976, Ser. No. 688,698

Int. Cl.[2] B22C *13/02, 15/02, 17/00*

U.S. Cl. 164—161 11 Claims



1. Apparatus for the automatic manufacture of sand molds, cores or the like for use in casting foundry pieces, comprising

a first continuous conveyor having a plurality of pattern pieces and flasks attached thereto, each of said flasks being movable with said conveyor from a vertically upright position through an inverted position and back to an upright position,

means connected to said flask and pattern pieces for mounting said flask and pattern pieces on said first conveyor for limited vertical movement with respect thereto, and guide means on said first conveyor for operating with said mounting means for guiding the limited vertical movement,

means adjacent said first conveyor for filling each of said flasks with sand-binder mixture when each flask is in an upright position at a filling location,

means adjacent said first conveyor for compacting said sand-binder mixture into a filled flask,

a second conveyor disposed below said first conveyor and operable to cooperate with said flasks of said first conveyor system when said flasks are in said inverted position, said flasks and said sand molds, cores or the like therein being brought into abutting engagement with said second conveyor when said flasks are moved into said inverted position after at least partial curing of the binder of said sand-binder mixture so that the sand-binder mixture in said flask will remain intact as a sand mold, core, or the like when inverted and separated from said flask, and

means adjacent said second conveyor for effecting release of said sand molds, cores, or the like from said flasks when said flasks are in an inverted position and displaced with respect to said first conveyor said means including means for moving said flasks away from said second conveyor and toward said first conveyor to separate said molds from said flasks completely, each of said flasks in turn being moved back into an upright position for receipt of further sand-binder mixture therein while said formed sand molds, cores, or the like are conveyed away by said second conveyor.

4,037,646

MOLDS FOR CONTINUOUSLY CASTING STEEL

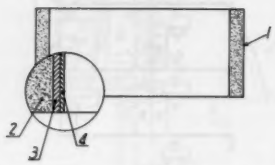
Senri Hara; Tomohiko Kimura, both of Ibaragi; Hiroshi Tomono, Wakayama, and Takayuki Sato, Osaka, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Satosen Company Limited, both of Osaka, Japan

Filed June 4, 1976, Ser. No. 692,909

Claims priority, application Japan, June 13, 1975, 50-72170; Oct. 27, 1975, 50-129556; Oct. 27, 1975, 50-129557

Int. Cl.[2] B22C *9/06;* B22D *11/00*

U.S. Cl. 164—273 R 14 Claims



1. A copper or copper alloy mold for continuously casting steel characterized in that the mold has a first layer formed on its interior surface and consisting essentially of at least one of nickel and cobalt and a second layer formed on the first layer and consisting essentially of at least one of nickel and cobalt as a main component and at least one of phosphorus and boron.

4,037,647

STRAND GUIDE FRAMEWORK FOR SUPPORTING A PARTIALLY SOLIDIFIED STRAND IN A CONTINUOUS CASTING INSTALLATION

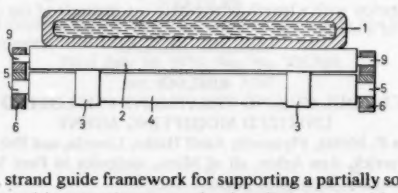
Hans Streubel, Dusseldorf, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Dec. 9, 1974, Ser. No. 530,522

Claims priority, application Germany, Dec. 21, 1973, 2363841

Int. Cl.[2] B22D *11/128, 11/124*

U.S. Cl. 164—282 8 Claims



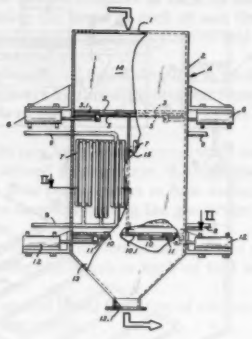
1. A strand guide framework for supporting a partially solidified strand in a continuous casting installation comprising at least two guide roller pairs which successively follow one another in the direction of travel of the strand, support rollers supporting said guide rollers, the lengthwise axes of the support rollers being arranged with respect to the lengthwise axes of the guide rollers approximately in a plane located transverse to the direction of travel of the strand, said framework being equipped with secondary cooling means, each of the support rollers being provided with means cooperating with an associated guide roller and positioned at spaced predetermined points intermediate the ends of each support roller for providing restoring bending moments in said associated guide roller outwardly of each of said predetermined points, said cooperating means comprising only two support collars on each of said support rollers, the minimum spacing between the guide rollers is determined by the diameter of the support rollers and the space required for the secondary cooling means, and wherein the support collars are mounted such that the bending of the guide rollers is less than the bending of the support rollers.

4,037,648

METHOD OF COOLING RECOVERED SAND FOR CASTING PURPOSES AND APPARATUS THEREFOR

Sisir Kumar Maitra, Hamburg-Oststeinbek, Germany, assignor to Alfred Gutmann Gesellschaft fur Maschinenbau, Hamburg, Germany

Filed Apr. 3, 1975, Ser. No. 564,904
Claims priority, application Germany, Oct. 2, 1974, 2447008
Int. Cl.[2] F28F *28/00*
U.S. Cl. 165—13 5 Claims



1. An apparatus for cooling recovered sand for casting purposes, said apparatus comprising a bunker defining an internal cavity having sand-receiving and discharging chambers respectively disposed at the top and bottom of the internal cavity, the bunker having a top feed opening communicating with the sand-receiving chamber and also having a bottom discharge means for said sand discharging chamber, the bunker also having upright partition walls in the internal cavity and dividing the cavity into a plurality of discrete adjacent cooling compartments located between said receiving and discharging chambers, the bunker also having spaced transverse walls joining the upright partitions and defining top and bottom walls of said cooling compartment, the top wall having a plurality of upper inlet openings each communicating with a respective cooling compartment and with said sand-receiving chamber, the bottom wall having a plurality of bottom discharge openings each communicating with a respective cooling compartment and with said discharging chamber, said bunker also having heat exchanger means disposed within each of said cooling compartments, and a plurality of individually controllable and operable gate means at each of said inlet openings and discharge openings in said top and bottom walls and having power operated means for opening and closing individual gate means individually controlling the flow of sand through said openings into and out of said cooling compartments.

4,037,649

HEATING AND REFRIGERATION SYSTEM

Dale R. Hartka, 18015 Parkside, Detroit, Mich. 48221

Filed Apr. 4, 1975, Ser. No. 565,236
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—16 5 Claims

2. A combined air-heating and refrigeration system wherein the air temperature of a living space is maintained within a predetermined range, said air-heating portion of said system comprising:

a furnace having a heat exchanger for heating air flowing therby;

first duct means for selectively admitting air from inside said living space for circulation past said furnace for heating said air;

second duct means for selectively returning said air from said furnace to said living space;

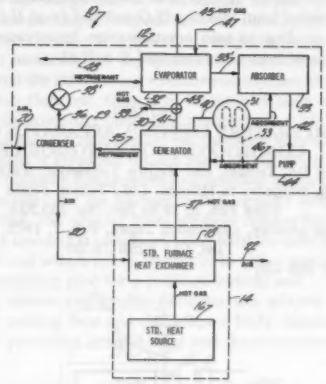
the refrigeration portion of said system comprising:

a refrigerant;

a condenser for condensing said refrigerator;

an evaporator for evaporating said refrigerant;

conduits interconnecting said elements to provide a circuit for said refrigerant;



first heat exchanger means associated with said condenser for preheating the air passing through said condenser for preheating the air passing through said first duct means; and

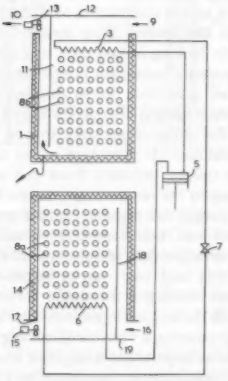
second heat exchanger means for transferring excess heat from said furnace to said evaporator to heat said refrigerant.

4,037,650

THERMAL STORAGE APPARATUS

John Edward Randall, Wirral, England, assignor to National Research Development Corporation, London, England

Filed May 23, 1975, Ser. No. 580,224
Int. Cl.[2] F25B *27/02;* G05D *23/00;* C09K *3/18, 5/00*
U.S. Cl. 165—29 13 Claims



1. A thermal storage apparatus comprising a first thermal storage vessel containing a first thermal storage medium, which is capable of being maintained at a temperature below a pre-selected temperature, a second thermal storage vessel containing a second thermal storage medium, which is capable of being maintained at a temperature above said pre-selected temperature, and a refrigeration system for transferring heat from said first storage vessel to said second storage vessel, said second storage thermal medium in said second storage vessel comprises at least one crystallisable salt hydrate of the formula

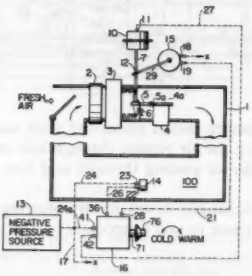
S. x H_2O having a crystallisation temperature in excess of said pre-selected temperature, said hydrate having the characteristic of at least partially dissociating at a temperature above its crystallisation temperature according to the equation *S. x H_2O* → *S. y H_2O* + *(x–y) H_2O*, wherein *y* is not greater than *x* and may be zero, said compound *S.y H_2O* being at least partially soluble in said *(x–y) H_2O*, said dissolution occurring with the absorbtion of heat, said *S. y H_2O* and said *(x–y) H_2O* recombining on cooling to said crystallisation temperature with the evolution of heat to reform said *S. x H_2O*.

4,037,651

TEMPERATURE CONTROL APPARATUS OF AIR CONDITIONER FOR AUTOMOBILES

Tosikatu Ito, Tohkai, and Reijiro Takahashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,533
Claims priority, application Japan, Feb. 7, 1975, 50-15402
Int. Cl.² F25B *29/00*
U.S. Cl. 165—30 **15 Claims**



14. A temperature control apparatus of an air conditioner for motor vehicles having a negative pressure source, an engine, and a compartment to be air conditioned, comprising: an air duct connected to the compartment; blower means for circulating air through said duct and the compartment; cooler means disposed in said duct to cool the air flowing through said duct; heater means disposed in said duct for reheating air passing through the heater; door means for controlling the proportion of air flowing in said duct that passes through said heater means; actuator means for controlling the movement of said door means according to an applied negative control pressure; regulator means for producing a negative output pressure from the negative pressure source according to the movement of said door; temperature sensor means for producing a negative output pressure from the negative pressure source according to the temperature within the compartment; means for comparing the negative output pressures from said regulator means and said temperature sensing means, and producing a corresponding displacement correlated to the deviation between said two output negative pressures; and controller means having a moveable throttling valve fluid inserted between the negative pressure source and said actuator means and producing a variable throttling according to said displacement so as to produce a negative control pressure for said actuator to minimize the deviation between said two output signals.

4,037,652

SOLAR HEAT STORAGE SYSTEM

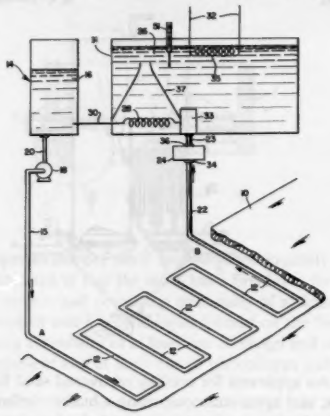
Hans Brugger, Gran View 9-W, Nyack, N.Y. 10960

Filed Jan. 30, 1976, Ser. No. 653,701
Int. Cl.² F28D *21/00*
U.S. Cl. 165—45 **7 Claims**

1. A solar heat storage system for a building including in combination a storage vessel containing a liquid medium for storing solar energy and solar heat collection means, said solar heat collection means comprising:

an expansion tank located above street level for housing a predetermined heat transfer liquid adapted to absorb solar energy;

a network of conductive conduits serially connected and arranged below street level in a serpentine fashion along a common plane disposed in an inclined position with respect to the street level such that each conductive conduit



rises to a higher level relative to each preceding conductive conduit;

means coupling said network of conduits to said expansion tank and to said vessel for forming a closed circulation loop for said predetermined heat transfer liquid;

an overlayment of blacktop located above said network of conduits; and

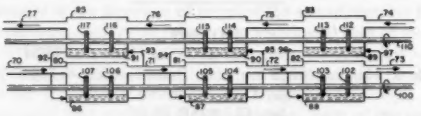
heat exchange means communicating between said network of conduits and said storage vessel for transferring heat from said predetermined liquid to said liquid medium.

4,037,653

HIGH-TEMPERATURE THERMAL EXCHANGE PROCESS

Herman P. Meissner, Windchester, Mass., and Frank C. Schora, Palatine, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation of Ser. No. 414,202, Nov. 9, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,624
Int. Cl.² F28C *3/06*
U.S. Cl. 165—1 **8 Claims**



1. A process for providing heat transfer between a pair of gas streams which comprises:

providing a plurality of first and second confined horizontal flow passageways, said first passageways joined in a first series and said second passageways joined in a second series;

providing a plurality of first and second pools at the bottom of each of said first and second passageways, respectively, containing liquid having a low viscosity and a low vapor pressure over the temperature range used and selected

from the group consisting of molten metal and molten inorganic salt;

generating a plurality of liquid droplets in each said first flow passageways by throwing droplets from each of said first pools of liquid in the bottom of said first passageways;

passing a gas stream, at a higher temperature than the droplets in said first passageways, through the plurality of said first flow passageways in heat exchange relationship with the droplets cooling the gas stream and heating said droplets;

recovering the heated droplets in each of said first pools thereby heating the liquid in each of said first pools;

transferring said heated liquid from one of said first pools to one of said second pools;

generating a plurality of liquid droplets in each said second flow passageways by throwing droplets from each of said second pools of liquids in the bottom of said second passageways;

passing a gas stream, at a lower temperature than the droplets in said second passageways, through the plurality of said second flow passageways in heat exchange relationship with the droplets heating the gas stream and cooling said droplets;

recovering the cooled droplets in each of said second pools thereby cooling the liquid in each of said second pools; and

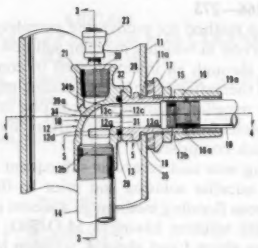
recycling said cooled liquid from one of said second pools to one of said first pools.

4,037,654

PITLESS WELL ADAPTER APPARATUS

Neil C. Lien, Evansville, Wis., assignor to Baker Manufacturing Company, Evansville, Wis.

Filed Sept. 29, 1976, Ser. No. 727,712
Int. Cl.[2] E21B *33/03*; F16L *55/00*
U.S. Cl. 166—88 **7 Claims**



1. A pitless adapter apparatus for connecting a well drop pipe to a delivery pipe through an opening in a well casing, comprising:

a. an adapter outlet member having an interior bore extending therethrough with an intake opening and a discharge opening for communication with a delivery pipe, a sealing face extending around the intake opening, an inverted U-shaped flange extending partially around the sealing face and having an arcuate upper portion and a pair of straight sides extending downwardly to a point below the lower margin of the intake opening, the peripheral surface of the flange being outwardly beveled at an angle of approximately 45° to the sealing face;

b. an adapter body member having a central bore extending therethrough with a bottom opening for communication with a well drop pipe and a side opening, a side face extending around the side opening, and an inverted U-shaped skirt extending outwardly from the adapter body member and having an arcuate upper portion extending above the side opening and a pair of straight sides extending downwardly from the upper arcuate portion on either side of the side opening to a point below the lower margin of the side opening, the skirt having a groove being inwardly beveled at an angle of approximately 45° to the side face and extending about the inner periphery of the skirt, the skirt being slideably engageable on the adapter outlet member flange whereby the body side opening and outlet member intake opening are substantially in registry and engagement of the beveled surfaces of the straight sides of the flange and skirt in mating relation prevents significant parting movement between the engaged members when the adapter apparatus is subjected to operating pressure moments, the engageable beveled surfaces of the flange and the skirt having a relative coefficient of friction no greater than one, the top of the adapter body member having an upwardly opening threaded bore with an outwardly flared portion around the threaded bore to locate and engage a threaded lift-out pipe within the threaded bore to facilitate engagement and removal of the adapter body member on the adapter outlet member within the well casing, the adapter body member further having an auxiliary opening in communication with the central interior bore and which opens upwardly to allow engagement of a connecting pipe for a pressure switch; and

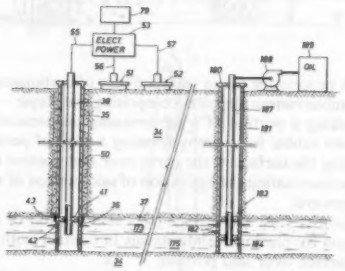
c. sealing means engageable between the adapter outlet member sealing face and the adapter body member side face for providing a water-tight seal therebetween.

4,037,655

METHOD FOR SECONDARY RECOVERY OF OIL

Neil L. Carpenter, Kerrville, Tex., assignor to Electroflood Company, Houston, Tex.

Continuation of Ser. No. 462,326, April 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 228,846, Feb. 24, 1972, abandoned. This application Oct. 21, 1975, Ser. No. 624,391
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 **10 Claims**



1. A method of increasing the internal pressure in a fluid-bearing earth formation, comprising the steps of

establishing at least two spaced apart boreholes extending into a subsurface earth formation containing both oil and other aqueous liquids,

disposing a separate electrical conductor in each of said boreholes and into electrical contact with said aqueous liquids in said formation,

insulating both of said conductors from substantially all earth materials adjacent said boreholes and lying above said subsurface earth formation to establish an electrical path composed of said insulated conductors and said formation materials extending therebetween,

establishing an AC flow of electric current in said electrical path composed of said insulated conductors and said formation materials lying therebetween,

electrochemically generating free hydrogen gas in said subsurface earth formation between said boreholes as a function of current intensity in said formation, and

trapping said free hydrogen gas in said formation to increase the pressure in said formation on said oil therein.

4,037,656

OIL RECOVERY METHOD EMPLOYING ACIDS EXTRACTED FROM CRUDES USING ANION-EXCHANGE PROCESS

James E. Cooper, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,876
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—270 8 Claims

1. A method of producing oil from an oil-containing subterranean formation penetrated by an injection well and a production well, comprising the steps of:

a. contacting an oil containing carboxylic acids with an ion-exchange resin to selectively remove said carboxylic acids therefrom;

b. removing said carboxylic acids from said ion-exchange resin;

c. injecting said removed carboxylic acids via said injection well into said formation;

d. injecting an aqueous caustic solution via said injection well into said subterranean formation; and

e. producing oil via said production well from said subterranean formation.

4,037,657

PROCESS FOR RECOVERY OF CARBONACEOUS MATERIALS FROM SUBTERRANEAN DEPOSITS BY IN SITU PROCESSING

Mitchell A. Lekas, 1015 Bermuda Drive, Concord, Calif. 94518

Filed Sept. 5, 1975, Ser. No. 610,694
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—271 16 Claims

1. A process for the in situ recovery of carbonaceous values from subterranean deposits comprising the steps;

breaking a portion of a subterranean carbonaceous deposit into rubble for thereby forming a zone of permeability;

raising the surface of the earth over said portion upward for accomodating the expansion of said portion of said deposit upward;

sealing at least the surface over said portion of said formation by placing sealing means in contact with said entire surface over said portion;

providing inlet means for communicating reacting fluid for initiating and controlling an extraction process within said zone of permeability;

forming an outlet communicating with said zone of permeability beneath said surface for withdrawing carbonaceous values from said deposit;

initiating an extraction process near said inlet for driving said carbonaceous values from said deposit by way of said outlet; and

continuing said extraction process while simultaneous therewith withdrawing said values from said deposit.

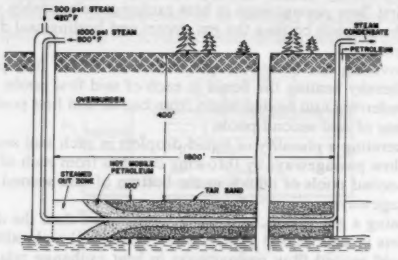
4,037,658

METHOD OF RECOVERING VISCOUS PETROLEUM FROM AN UNDERGROUND FORMATION

Donald J. Anderson, Newport Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 30, 1975, Ser. No. 627,304
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 14 Claims

1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising forming a hole through a petroleum-containing formation; forming a flow path in said hole isolated from said formation for flow of fluid through said formation into and out of said hole; flowing a hot fluid through said flow path out of contact with said formation to heat viscous petroleum in said formation outside said flow path to reduce the viscosity of at least a portion of the



petroleum adjacent the outside of said flow path to provide a potential passage for fluid flow through said formation adjacent the outside of said flow path and injecting a drive fluid into said formation through said passage adjacent the outside of said flow path to promote movement of the petroleum through said passage adjacent the outside of said flow path to a recovery position for recovery from said formation.

4,037,659

MICELLAR FLOODING PROCESS FOR RECOVERING OIL FROM PETROLEUM RESERVOIRS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 2, 1976, Ser. No. 710,543
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—273 14 Claims

1. In the method for recovering petroleum from a subterranean reservoir in which a micellar solution is injected into the reservoir through an injection well in communication therewith, and thereafter an aqueous flooding medium is injected to drive the micellar solution towards one or more spaced production wells from which fluids are recovered, the improvement which comprises:

injecting into said reservoir subsequent to the injection of said micellar solution and prior to the injection of said aqueous flooding medium an aqueous alkaline alkali metal silicate solution having a M_2O/SiO_2 molar ratio of between about 1 and about 4, wherein M is an alkali metal.

4,037,660

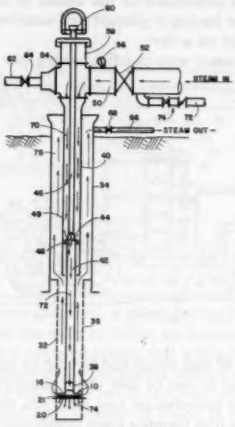
METHOD FOR STEAM CLEANING LINERS IN OIL WELL BORES

William D. Newsom, and James R. Carnahan, both of Bakersfield, Calif., assignors to K. R. Evans & Associates, Bakersfield, Calif., a part interest

Filed May 28, 1974, Ser. No. 473,697
Int. Cl.[2] E21B *37/00*
U.S. Cl. 166—302 6 Claims

1. A method of steam cleaning a subsurface liner in a producing well bore having production equipment therein and comprising removing of the production equipment from the well bore, connecting a steam head to the lower end of a first tubing string, lowering the first tubing string and stream head into the well bore, landing the first tubing string with the lower end thereof spaced above the upper end of the liner, lowering connecting means through the first tubing string, connecting said connecting means with the steam head, disconnecting the steam head from the first tubing string, lowering the steam head into the interior of the liner, introducing steam at high pressure and high temperature into the interior of the first tubing string, diverting the steam into the interior of the steam

head, directing the steam radially outwardly from the steam head during lowering thereof in said liner for impinging against the inner periphery of the liner, maintaining the steam at substantially constant volume during said radial directing thereof for maintaining high temperature and high pressure for discharge of the steam from the steam head at high temperature and high pressure, and directing the spent stream upwardly in the wall bore around the first tubing string for discharge from the well bore, elevating the steam head to the lower end of the first tubing string, connecting the steam head with the first tubing string, disconnecting the connecting means from the steam head, and raising the tubing string and steam head for removal thereof from the well bore.

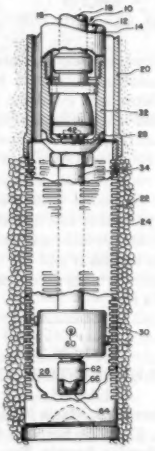


4,037,661

METHOD AND APPARATUS FOR CLEANING A SCREENED WELL

George Alan Ford, Houston, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed June 18, 1976, Ser. No. 697,404
Int. Cl.[2] E21B *37/00, 43/25*
U.S. Cl. 166—311 **11 Claims**



1. A method for developing or cleaning a screened well employing a system of apparatus including a source of compressed air, a string of dual concentric drill pipe defining first and second fluid flow conduits, means for injecting air from said second conduit into said first conduit and a head adapted for fluid communication with said first conduit and including an entrance orifice for admitting formation liquid from said well and an exit orifice for directing compressed air toward said screen, said method comprising the steps of:

a. connecting said source to said first conduit;

b. directing compressed air through said first conduit, into said head and out said exit orifice to agitate said liquid and clear said screen;

c. disconnecting said source from said first conduit and connecting said source to said second conduit; and

d. injecting air from said second conduit into said first conduit at a point above said head, to draw said liquid into said head through said entrance orifice and to pump said liquid together with any solids present to the surface through said first conduit by air-lift.

11. A tool for developing or cleaning a screened well in conjunction with a string of dual drill pipe having concentrically disposed inner and outer pipes defining continuous annular and central flow passages, said tool comprising:

an inner tubular member adapted for fluid interconnection with the central flow passage of said string;

a head attached to said inner member and including means to direct fluid from said central passage toward the screen of said well;

an outer tubular member adapted for fluid interconnection with the annular flow passage of said string; and

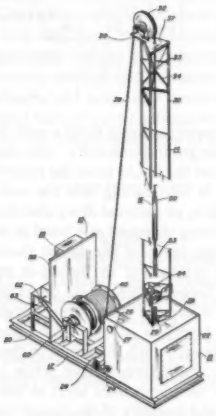
means for diverting fluid flow from said annular flow passage into said central flow passage.

4,037,662

AUTOMATED BAILING APPARATUS IN FLEXIBLE COMBINATION FOR BAILING SHALLOW WELLS

Leslie Bowling, 1228 First National Bank of Commerce Bldg., New Orleans, La. 70112

Filed Aug. 30, 1976, Ser. No. 718,495
Int. Cl.[2] E21B *37/00, 27/00*
U.S. Cl. 166—311 **9 Claims**



1. In an automated bailing apparatus, flexible in ranges of sizes of structure and material, and adjustable in operating parameters, for bailing shallow wells comprising in combination:

a. portable base means for installing over and around a shallow well production casing end extending above ground and said portable base means;

b. stationary tank assembly means, having sides, an enclosed top defining an opening, and a closed bottom defining a sleeved hole extending upwardly therein and in alignment with said top opening, mountable on said base means and

adapted to receive in said sleeved hole said production casing end, fluid tight;

c. hoisting tackle means having in combination a hoisting tower with hoisting line mounted in and over said tank assembly means and in alignment with said top opening, and a drum or windlass mounted on said base means adjacent said tank assembly means, for raising and lowering a free end of said hoisting line through said aligned top opening and into said tank assembly means and shallow well production casing:

d. bailer means secured to the free end of said line of the hoisting tackle means for raising liquid from said shallow well and discharging it above and into said tank assembly means; and

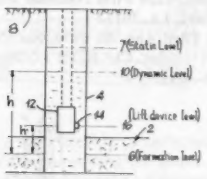
e. control assembly means, having operating control means for actuating said hoisting tackle means and bailer means to travel full speed for a part of each trip from bottom of said shallow well to above said tank assembly means and return and half speed for a predetermined distance as the respective extremities of travel are approached, and adjustable to automatically bail any shallow well continuously for any period, depth, and desirable range of rates of bailing, and safety control means for cutting-off power in case of malfunction, separately or together, of any of the preceeding means.

4,037,663

METHOD FOR WELL EXPLOITATION

Smil Buchman, P.O. Box 9219, Tel Aviv, Israel

Filed Oct. 24, 1972, Ser. No. 299,674
Claims priority, application Israel, Dec. 17, 1971, 38393
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—314 **6 Claims**



1. A methd of pumping a liquid from a well bore communicating with an underground reservoir, the reservoir energy being used to transport the liquid from the reservoir to the well bore, characterized in introducing into the well bore a pump having a drive member, an external drive therefor, an inlet, and an outlet, the inlet being disposed at a level in the bore which is below the dynamic level of the liquid therein, the pump being such that the pressure of the liquid at the inlet applies equal and opposite forces to the pump drive member so that the latter is driven solely by the external drive and does not dissipate the liquid reservoir energy at the pump inlet level; and operating said pump to lift the liquid to the surface of the well bore solely by the external drive while conserving the reservoir energy at the pump inlet level in the well bore for increasing the rate and quantity of the liquid transported from the underground reservoir to the well bore by said reservoir energy.

4,037,664

FIRE FIGHTING-FOAM PRODUCING MODULE

John C. Gibson, Lawrence, Mass., assignor to Gibson Motor and Machine Service, Inc., Lawrence, Mass.

Filed Nov. 10, 1975, Ser. No. 630,326
Int. Cl.[2] A62C *5/02, 27/08*
U.S. Cl. 169—15 **6 Claims**

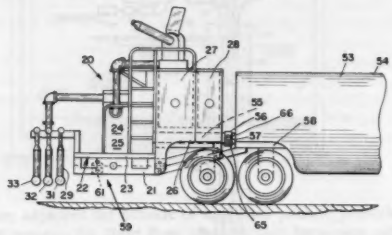
1. A fire-fighting, foam-producing, module usable as an independent unit connected to a hydrant water supply or as a portable, vehicle-mounted, unit connected to the water tank of a water tank truck, as a water supply said module comprising:

a sub-frame supporting a platform;

internal combustion engine driven, fluid pump means mounted on said platform;

at least one foam spreader bar, mounted at the rear of said module and connected to the outlet of said pump, said spreader bar having a plurality of nozzles for dispersing pumped fluid on a fire;

an inflexible, water way conduit having one end connected



to the inlet of said pump and having its other end detachably coupled to one of said water supplies,

a pair of tanks mounted on said platform, one tank containing aqueous film forming foam composition and the other tank containing protein composition,

mixing valve means, including conduits leading from each said tank into said pump means for selectively introducing one said composition, the other said composition or both, into the water pumped from said water supply,

and quick release means for detachably affixing said subframe on said tank truck.

4,037,665

FIRE EXTINGUISHER CONTAINING A HIGH INTERNAL PHASE RATIO EMULSION AS FIRE EXTINGUISHING AGENT

Larry R. Hopper, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 446,646, Feb. 28, 1974, Pat. No. 3,984,334, which is a continuation-in-part of Ser. No. 108,215, Jan. 20, 1971, abandoned. This application June 22, 1976, Ser. No. 698,579
Int. Cl.[2] A62D *1/00*
U.S. Cl. 169—49 **6 Claims**

1. A fire extinguisher comprising a container containing (1) an essentially nonflammable thixotropic high internal phase ratio water-in-oil emulsion, said emulsion having the characteristics of an elastic solid when at rest, of an extremely viscous liquid at low shear conditions and of a low viscosity medium under moderate shear rates, said emulsion being highly resistant to destruction by radiant heat, said emulsion comprising water, an emulsifiable oil and a biodegradable oxyalkylated emulsifying agent not presistent and harmful to wild life, said water being present in said emulsion in an amount of at least 60% by volume of the emulsion and (2) means for expelling said thixotropic emulsion through an opening in the container onto or in the path of a fire.

4,037,666

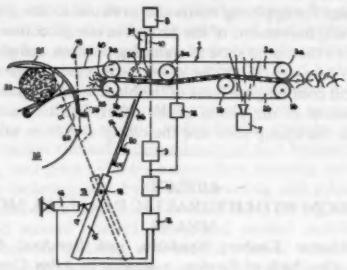
APPARATUS FOR HARVESTING AND BUNDLING PLANTS

Karl Friedrich Rath, Farrach 8, Maria Rojach, Austria (A-9422)

Filed Dec. 17, 1975, Ser. No. 641,636
Claims priority, application Austria, Dec. 23, 1974, 10304/74
Int. Cl.[2] A01D *33/10*
U.S. Cl. 171—61 **15 Claims**

1. An apparatus for harvesting and bundling leafy or woody plants, which comprises a plant uprooting and removal device

for sequentially uprooting the plants from the soil and for removing the uprooted plants along a guided path, to an end of the path, and the improvement of a classifying and counting means arranged in the path for responding to plants meeting a minimum standard of plant size and counting the plants meeting said minimum standard, a plant packaging device spaced from the end of the path to define an accumulating space for the removed and counted plants, and a means for moving the accumulated plants to the packaging device, responsive to the counting device reaching a predetermined set limit number for accumulating said limit number of plants in said space.

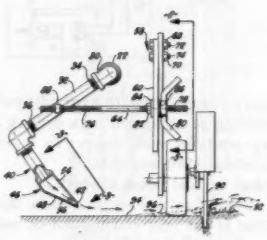


4,037,667

BLOWER FOR EDGER

Michael Gonsalves, 2586 Nodal Ave., Castro Valley, Calif. 94546, and Constante C. Sarmiento, 33947-13th St., Union City, Calif. 94587

Filed Dec. 22, 1975, Ser. No. 643,400
Int. Cl.[2] A01D *35/00*; A01G *3/06*
U.S. Cl. 172—14 **7 Claims**



1. A blower apparatus for an exhaust gas producing plant cutter comprising:

a. hollow member affixed to conduit exhaust gases from the plant cutter;

b. rotatable hollow member communicating with said hollow member said rotatable hollow member having an end portion culminating in a terminal opening behind the cutting mechanism of the plant cutter, the rotation of said rotatable hollow member adjusting the distance betwen said terminal opening and the cut vegetation resulting from the cutting mechanism of the plant cutter, such that exhaust gases from the cutter pass through said hollow member, rotatable hollow member, and terminal opening, said distance adjustment varying the ability of the exhaust gases to blow the plant cuttings;

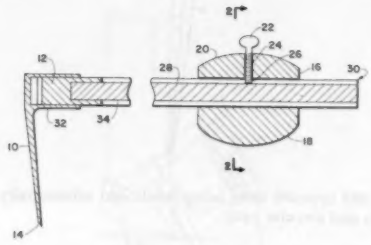
c. adjustable support means for positioning said rotatable hollow member against the forces of gravity and reaction force exerted by the exhaust gases, said adjustable support means comprising a slotted bracket affixed to a portion of the plant cutter; an elongated member fitting within said slot and movable along the length of said slot; means for holding said elongated member to said rotatable member and means for fixing said elongated member to said slotted bracket.

4,037,668

GARDENING IMPLEMENT WITH OFFCENTER BALANCING WEIGHT

Terry M. Svejda, R.R. No. 2 Box 95, Mo. Valley, Iowa 51555

Filed Apr. 14, 1976, Ser. No. 676,852
Int. Cl.[2] A01B *1/08*
U.S. Cl. 172—371 **3 Claims**



1. A gardening implement comprising a handle and a flat blade fixedly secured thereto whose lateral surfaces extend substantially perpendicular to the longitudinal axis of said handle, said longitudinal axis passing through said surfaces at a point adjacent a marginal edge of said plate, said plate having another marginal edge extending perpendicularly to said longitudinal axis, said another marginal edge for use on the earth in a gardening operation, a solid balancing weight, fastening means to selectively manually secure said balancing weight along the length of said handle, balancing means for balancing the weight of said plate by locating the centroid of gravity of said balancing weight at preferentially located surfaces of said handle, said fastening means including a threaded rod element threadingly engaged within said balancing weight, one end of said threaded rod element being disposed in clamping touching engagement with said handle, said balancing means including said balancing weight having a substantially geometrically off center hole passing through said balancing weight, said handle extending through said hole, said centroid of gravity of said balancing weight being located a distance substantially radially outwardly from the longitudinal axis of said hole.

4,037,669

TINE CULTIVATOR

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Division of Ser. No. 450,671, March 13, 1974, Pat. No. 3,943,999. This application Nov. 19, 1975, Ser. No. 633,567
Claims priority, application Netherlands, Mar. 19, 1973, 7303763
Int. Cl.[2] A01B *33/00*
U.S. Cl. 172—59 **7 Claims**

1. A cultivator comprising a soil working member rotatably mounted on an upwardly extending shaft, said member including a support and at least one downwardly extending tine that is offset from said shaft, said tine being positioned to trace a circular path and work the ground during rotation, said tine including an upper fastening portion secured to the support and a soil working porton, the latter portion a first upper straight part that adjoins said fastening portion, the center lines of said fastening portion and said upper part coinciding with one another, a second and lower straight part of said soil working portion being inclined outwardly with respect to said first

part relative to said shaft, said second part having opposite sides which flatten and broaden towards a lowermost tip of the

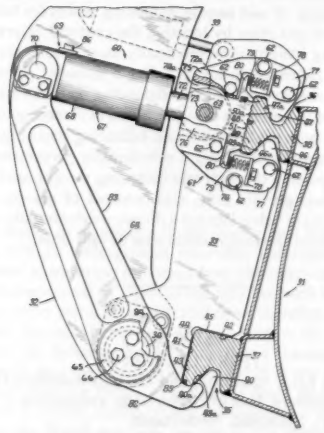
tine, said opposite sides being positioned substantially tangential to said circular path.

4,037,670

MOTOR GRADER WITH BLADE CLAMPING MECHANISM

Robert Allan Atherton, Chillicothe, and Carroll Richard Cole, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1976, Ser. No. 696,160
Int. Cl.[2] E02F *3/76;* A01B *65/02*
U.S. Cl. 172—795 **14 Claims**



1. In a motor grader which has a circle with depending blade support arms, blade support means mounted on said arms on transverse pivots, a grader blade assembly which includes a lower support rail and an upper support rail carried in said blade support means for lateral sliding movement between confining surfaces which restrict vertical and fore-and-aft movement of the rails in the support means, and a hydraulic ram for shifting the blade assembly laterally in the support means, a blade clamping mechanism comprising, in combination:

a clamp shoe bracket on the blade support means behind the upper support rail;

a clamp shoe mounted on said bracket for movement between a release position spaced slightly from the upper support rail and a clamping position bearing against the rear of said upper support rail;

a clamp lever pivoted on the blade support means directly behind the lower support rail, said lever leaving having a long input arm with a free end directly behind the clamp shoe, and said lever having a short clamp arm in the vertical plane with the lower support rail;

a hydraulic ram which has a cylinder operatively connected to the input arm and a piston with a piston rod operatively connected to the clamp shoe;

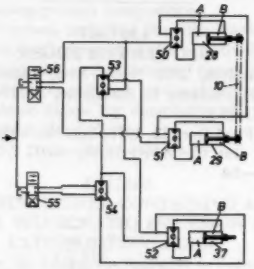
and means for applying hydraulic pressure to the piston of said ram, movement of the pisiton in one direction acting to move the clamp shoe to clamping position and pivot the clamp lever to force the clamp arm against one of the vertical confining surfaces of the blade support means, and movement of the piston in the other direction acting to release the clamp shoe and the clamp arm from said rails.

4,037,671

DRILL BOOM WITH HYDRAULIC PARALLEL MOTION MEANS

Erich Voldemar Kimber, Vendelso, and Per-Axel Carsten Ronne, Alta, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 480,518, June 18, 1974, abandoned.
This application Jan. 15, 1976, Ser. No. 649,249
Claims priority, application Sweden, July 3, 1973, 7309392
Int. Cl.[2] E21B *15/00;* F15B *11/22, 13/01*
U.S. Cl. 173—2 **6 Claims**



1. A drill boom arrangement with hydraulic parallel motion means for positioning an elongated rock drilling apparatus to different drilling positions with respect to a boom support, somprising in combination therewith:

a first cross shaft on said boom support,

a drill boom having forward and rear ends, said drill boom being pivoted at the rear end thereof on said first cross shaft,

a second cross shaft at the forward end of said drill boom for pivotally supporting said rock drilling apparatus,

an hydraulic elevating cylinder means pivotally connected at one end thereof to said drill boom and at the other end thereof to said boom support for selectively elevating and lowering the rock drilling apparatus to given elevation angles,

an hydraulic tilt cylinder means pivotally connected at one end thereof to said drill boom and at the other end thereof to said rock drilling apparatus for selectively tilting said rock drilling apparatus relative to said drill boom independently of said hydraulic elevating cylinder means, said hydraulic tilt cylinder means having a pair of hydraulic chambers,

an hydraulic pilot cylinder means having a pair of chambers and pivotally connected to said drill boom and to said boom support for sensing the elevation angle of said drill boom, and

an hydraulic circuit including fluid conduit means connecting one chamber of said hydraulic pilot cylinder means with one chamber of said hydraulic tilt cylinder means to selectively transfer hydraulic fluid therebetween to pro-

vide hydraulic slave coupling between said hydraulic pilot cylinder means and tilt cylinder means to concurrently operate same in order to tilt said rock drilling apparatus while maintaining parallel displacement of the rock drilling apparatus during operation of said hydraulic elevating cylinder means to change the drilling position; a common hydraulic control valve coupled to said hydraulic pilot, tilt and elevating cylinder means for alternately pressurizing the other chambers of said hydraulic pilot cylinder means and said hydraulic tilt cylinder means simultaneously with the chambers of said hydraulic elevating cylinder means during elevating and lowering of the rock drilling apparatus, respectively; a second control valve coupled to said hydraulic tilt cylinder means for actuation thereof independently of said hydraulic elevating and pilot cylinder means; first isolating valve means for isolating said hydraulic elevating and pilot cylinder means from said second control valve during actuation of said second control valve; and second isolating valve means for isolating said second control valve from said hydraulic tilt cylinder means during actuation of said common control valve, whereby said hydraulic pilot cylinder means assists the elevating movement of said drill boom and said hydraulic tilt cylinder means assists the lowering movement of said drill boom.

4,037,672

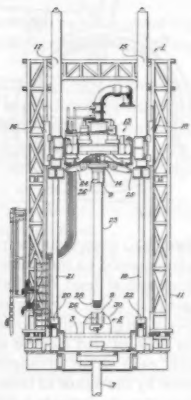
SHAFT DRILL BREAK-OUT SYSTEM

Lee Roy Hodge, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 497,172, Aug. 12, 1974, Pat. No. 3,942,592. This application Feb. 4, 1975, Ser. No. 546,856

Int. Cl.[2] E21D *9/02;* **E02D** *7/28;* **E21B** *19/16*

U.S. Cl. 173—157 **4 Claims**



1. In an earth boring machine having a hydraulic and reversible swivel, powered for reciprocable movement with a cross member along a mast to move a drill stem and a drill through a work table and in a bore hole, the improvement comprising:

pump means having three output pressure limits selectively applied to the power swivel to produce a largest, an intermediate and a smallest output torque limit;

break-out means carried by the cross member and having arms to engage slots on the drill stem to enable break-out between the power swivel and the drill stem;

slip means carried by the work table to support the drill stem when disconnected from the power swivel and to selectively engage slots in the drill stem to permit make-up and break-out; and

control means connected with the pump means to establish the smallest torque limit for drilling, the intermediate torque limit for make-up, and the largest torque limit for break-out and for make-up of the power swivel with the drill stem when removing the drill stem from the hole.

4,037,673

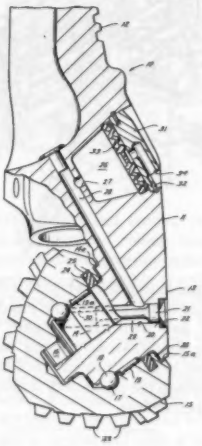
ROLLER CUTTER DRILL BIT

Daniel B. Justman, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed May 7, 1976, Ser. No. 684,125

Int. Cl.[2] E21B *9/10*

U.S. Cl. 175—371 **3 Claims**



1. A drill bit comprising:

at least one head,

a cylindrical boss on said head having a flat end surface,

a bearing shaft arranged on said head and extending from the flat end surface of said boss,

a cutter rotatably mounted on said bearing shaft and having a counterbore fitting over said flat end surface and guided for rotary motion on said cylindrical boss,

said cutter having a smaller bore opening from said counterbore and fitting on said bearing shaft,

said cutter having a circumferential groove in said smaller bore and spaced from said flat end surface,

an elastomeric seal ring in said groove in sealing engagement with said shaft, and

said boss, said flat end surface and counterbore defining a tortuous passage preventing ingress of detritus to the area of the seal ring in said smaller bore.

4,037,674

BALANCE FOR DETERMINING THE WEIGHT PERCENTAGE OF AN EXTRACTED COMPONENT WITH RESPECT TO THE TOTAL WEIGHT OF A TEST MATERIAL

Valery Konstantinovich Kuzmich, ulitsa Komarova, 10, korpus 3, kv. 12, and Yakov Tevelevich Dashevsky, ulitsa Frantsa-Meringa 1, kv. 11, both of Odessa, U.S.S.R.

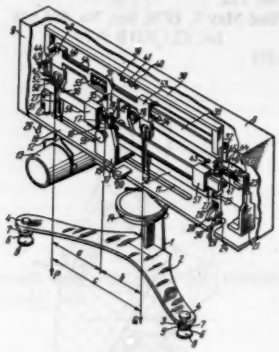
Filed Oct. 30, 1975, Ser. No. 627,039

Int. Cl.[2] G01G *19/00, 19/04, 1/18*

U.S. Cl. 177—200 **1 Claim**

1. A balance for determining the weight percentage of an extracted component with respect to the total weight of a test material, the balance comprising a first moving load-receiving unit to accept the extracted component of a test material, the weight percentage of which is to be determined; a second moving load-receiving unit to accept the remaining mass of the material; a beam in the form of a rectangular frame of two horizontal plates connected by two vertical plates; a support for carrying said beam; a linear scale applied to one of said

horizontal plates, to read off the weight percentage; said units being both located on one of said horizontal plates, namely one unit on each side of said support; a first rigid tie-rod rigidly connecting said units; a vernier on said first tie-rod; two movable balance weights on the other of said horizontal plates, namely one weight on each side of said support; a second rigid



tie-rod rigidly connecting said weights; a drum; an axle for said drum, fixed in said beam; and flexible ties connecting said drum with said units and with said weights; said units and said weights moving simultaneously along said beam in opposite directions as said drum is turned, until said beam reaches its equilibrium, at which the position of said vernier is used to read off the weight percentage.

4,037,675

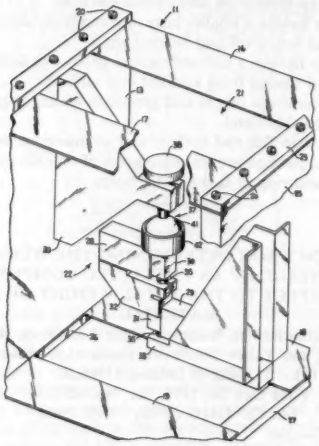
LEAF SPRING WEIGHING SCALE

Anthony Storace, Tarrytown, N.Y., and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 26, 1976, Ser. No. 680,155

Int. Cl.[2] G01G *3/08*

U.S. Cl. 177—229 **10 Claims**



1. A leaf spring weighing scale, comprising:

a weighing pan for receiving a load and which is movable through a weighing range in response to said load;

a support means;

a movable load support structure supporting said weighing pan for movement, and disposed between the support means and said pan, said load support structure including a pair of upper and lower spaced-apart leaf spring strips so arranged so as to form a parallelogram for providing a substantially linear load support and pan movement;

a first and a second deflection sensing load cell, said first and second load cels arranged in tandem, and operatively connected to said load support structure, said first first load cell being operative through a given portion of said weighing range, and said second load cell being operative through a remaining portion of said weighing range; and

interconnecting means operatively connecting said load support structure to said first and second load cells, said interconnecting means including a point contact connection disposed between said load support structure and said first and second load cells, said point contact connection having a ball in contact with a substantially flat surfaced anvil member, said point contact connection being operative to minimize load cell sensing errors introduced by any nonlinearities in the load support and pan movement.

4,037,676

POWERED INVALID-CHAIRS

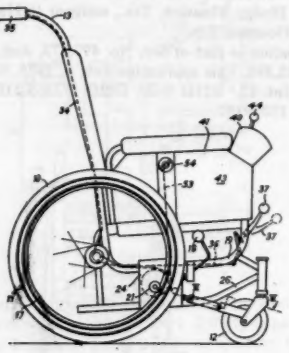
Edward Thipthorp Ruse, 304 Bournemouth Park Road, Southend-on-Sea, England

Filed July 24, 1975, Ser. No. 598,640

Claims priority, application United Kingdom, July 24, 1974, 32776/74; Oct. 16, 1974, 44903/74

Int. Cl.[2] B62D *11/04*

U.S. Cl. 180—6.5 **9 Claims**



1. An invalid wheelchair comprising a frame, two relatively large ground wheels mounted on the frame and having a common axis of rotation, and at least one further ground wheel mounted on the frame, an electric motor mounted adjacent to each of said relatively large ground wheels, and a drive arrangement between each of said electric motors and its adjacent ground wheel, each drive arrangement comprising a pulley which is driven by the motor to rotate on an axis parallel to the axis of rotation of said relatively large ground wheel and which has a driving surface, the pulley being adapted to swing into and out of engagement with said inner driven surface with the driving surface of the pulley following an arc which cuts the driven surface of the wheel at an acute angle so that the driving pulley swings towards the wheel in the direction opposed to the direction of movement of the driven surface and drives itself into engagement with the driven surface, control means for said drive arrangement, in which said control means include first manually-operable means to swing said pulleys into and out of engagement with the driven surfaces of the wheels, first electric switch means to close when said pulleys are in engagement with the driven surfaces and to open when said pulleys are out of engagement with the driven surfaces, second manually-operable means which are operated by an attendant to swing said pulleys into and out of engagement with the driven surfaces, and second switch means connected in series with said first switch means and operated by the

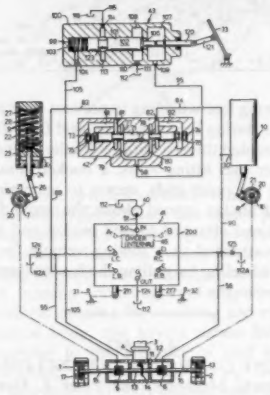
invalid to energise the two electric motors when said pulleys are in engagement with the driven surfaces, said second switch means being held closed when said second means are to be operated by the attendant.

4,037,677

COMBINED STEERING AND BRAKING MEANS FOR CRAWLER TRACTOR

George Paul Koch, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 15, 1975, Ser. No. 640,767
Int. Cl.[2] B62D *11/08*
U.S. Cl. 180—6.7 4 Claims



1. In a vehicle having a pair of ground engaging drive means and which is steered by selectively driving and braking said drive means:

an engine-driven fluid power shifted transmission;

a pair of spring applied fluid released steering clutches for transmitting motive power from said transmission to said ground engaging drive means;

a pair of spring applied fluid released brakes for said ground engaging drive means;

a pair of hydraulic actuators for operating said brakes;

a source of pressurized fluid;

combined steering and braking valve means connected to said source, to said clutches, and to said brake actuators and being selectively actuatable for controlling fluid flow from said source to said steering clutches to operate said clutches and to said brake actuators to operate said brakes;

a pair of movable control members operatively connected for selectively actuating said combined steering and braking valve means;

said combined steering and braking valve means being responsive to operation of said levers to effect automatic application of both brakes if both steering levers are simultaneously operated to disengage both clutches and to effect application of one brake for one track if one steering lever is operated to disengage one clutch for said one track;

supplemental brake control valve means;

a single movable brake member for selectively operating said supplemental brake control valve means; and

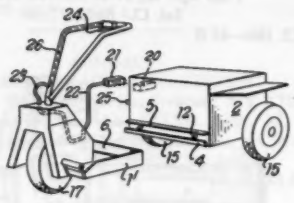
shuttle valve means operatively connected to said combined steering and braking valve means, to said brake actuators and to said supplemental brake control valve means and responsive to said supplemental brake control valve means for controlling fluid flow from said source to said brake actuators to provide for supplemental control of said brakes.

4,037,678

VEHICLE CHASSIS STRUCTURE

Rudi Helmut Braune, Griffin Hill, Thrupp, Stroud, Gloucestershire, England

Filed July 9, 1975, Ser. No. 594,293
Claims priority, application United Kingdom, July 12, 1974, 30936/74
Int. Cl.[2] B62K *5/06, 11/02*
U.S. Cl. 180—11 3 Claims



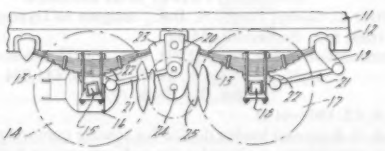
1. In a vehicle having first and second chassis units supported on respective independent rolling means, one of said chassis units being provided with steering means for the rolling means of said unit, and means releasably coupling sad first and second chassis units to each other, wherein the improvement comprises one of said chassis units having a horizontally disposed planar base member, and a planar end wall mounted in perpendicular abutment therewith and provided with a plurality of vertically elongated apertures, said planar base member and said end wall being arranged to define therebetween at least one elongated horizontal aperture, and wherein the other of said chassis units has a vertical end wall, at least one support flange mounted on said vertical end wall and arranged to pass through said at least one elongated horizontal aperture and to support said planar end wall of said one unit, and horizontaly disposed threaded clamping means mounted on said vertical end wall, said clamping means extending through said vertically elongated apertures of said planar end wall of said one unit, cooperatively threaded means being provided to rigidly clamp said planar end wall of said one chassis unit and said vertical end wall of said other chassis unit in complete surface abutment with each other, and at least one further flange mounted on said vertical end wall of said other unit to extend horizontally therefrom to be supported on top of said planar end wall of said one chassis unit, whereby a secure contact between chassis units over a large surface area is obtained.

4,037,679

SELECTIVE DRIVE FOR TRUCK DEAD AXLE

Herbert C. Ovshinsky, 15200 Leslie, Oak Park, Mich. 48237

Continuation-in-part of Ser. No. 574,501, May 5, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,735
Int. Cl.[2] B62D *61/10*
U.S. Cl. 180—24.12 13 Claims



1. In a drive for the tires of wheels on a dead axle of a vehicle disposed behind or in front of a differentially driven axle, a through rotatable shaft fixedly supported substantially midway between the centers of the driven and dead axles approximately in alignment therewith, an expandable tire fixedly mounted on each end of said rotatable through shaft so as to be located between said wheel tires, expanding means on said

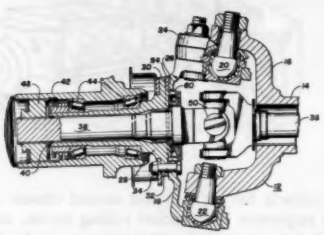
vehicle, and means expanding said expanding means to provide a drive when expanded between the tires on the wheels of the differential axle and the tires on the wheels on the dead axle.

4,037,680

APPARATUS FOR ADJUSTING CAMBER

Clinton E. Grove, 23-1st St. SE., Box 2013, Elbow Lake, Minn. 56531

Filed Apr. 23, 1975, Ser. No. 570,657
Int. Cl.[2] B60K *17/30*
U.S. Cl. 180—43 R **3 Claims**



1. In an axle assembly for supporting a driven, steerable wheel of a vehicle, the axle assembly comprising:

a rigid, hollow axle housing;

a yoke rigidly secured to one end of the said axle housing;

a steering knuckle pivotally mounted to said yoke to provide for steering of the wheel when said steering knuckle is pivoted, wherein said steering knuckle includes a first mounting pad;

a spindle for supporting the wheel for rotation, wherein said spindle includes a second mounting pad;

means for securing said spindle to said steering knuckle with said first and second mounting pads in facing relationship; and

means for transmitting power to said spindle including:

a. an axle rod extending interiorly of said axle housing, said axle rod having an interior end for attachment to a source of driving power to rotate said axle rod and an exterior end proximate to said one end of said axle housing,

b. a stub shaft encircled by said first and second mounting pads for cooperating with said spindle to provide powered rotation of the wheel, and

c. means cooperating with said exterior end of said axle rod and with said stub shaft for transmitting driving power to said stub shaft from said axle rod during pivoting of said steering knuckle;

the improvement comprising:

shim means interposed between said first and second mounting pads for controlling the camber of the wheel.

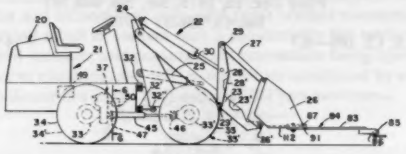
4,037,681

TOWABLE FRONT END LOADER

Oliver L. Gorby, Fargo, N. Dak., assignor to Dynamic Industries, Inc., Barnesville, Minn.

Continuation of Ser. No. 402,771, Oct. 2, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,024
Int. Cl.[2] B60K *17/34*
U.S. Cl. 180—44 R **3 Claims**

1. A front end loader device for towing comprising a front and rear frame, a pivotal activated connection between the front and rear frame, front and rear axles mounted to the front and rear frames, a pair of drive wheels mounted to said front and rear axles, a gear box having a plurality of reduction gears thereon engaged in a train to provide a gear reduction, said plurality of reduction gearing comprising a first input gear, intermediate reduction gears, and an output gear, said gear box being mounted to the front of said rear axle of said rear frame, a drive shaft connecting said output gear of said gear train to said rear axle, a drive shaft connecting said output gear to said front axle through universal joints, motor means connected to and powering said input gear whereby said intermediate reduction gears provides a reduced rotational speed to said output gear and to said drive shaft to drive said front and rear wheels of said loader to power the movement of said loader at very low speed, means to disengage at least one of said intermediate gears from said output gear to provide free wheeling of the wheels of the loader at relatively high speeds with said at least one of the intermediate and the input gear disengaged from the



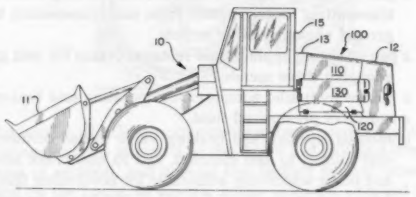
output gear during free wheeling to prevent their rotating with the output gear during free wheeling, said front frame having lifting arms mounted thereto with hydraulic cylinder means to raise and lower said lifting arms, a bucket mounted to said lifting arms at the outer ends, means to maintain said lifting arms with said bucket spaced above the ground, a tow arm having its one end attached to said bucket and its other end adapted to be attached to a towing vehicle for towing the loader in free wheeling by pulling the loader through the tow arm attachment to the bucket.

4,037,682

ENGINE COMPARTMENT ENCLOSURE

Don G. Sandrock, McHenry, and Peter J. Hoag, Arlington Heights, both of Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Feb. 20, 1976, Ser. No. 659,678
Int. Cl.[2] B62D *25/10*
U.S. Cl. 180—69 R **10 Claims**



1. In an engine enclosure having a top, side shields and opposite ends operatively enclosing an engine, the improvement comprising

a first panel hingedly supported from the enclosure top and extending downwardly therefrom to form a portion of the enclosure side,

a first hinge means joining said first panel to the enclosure top for pivotal movement relative thereto,

a second hingedly supported panel, forming another portion of the enclosure side, extending upwardly toward said first panel with an edge of said second panel spaced from the lowermost edge of said first panel,

a second hinge means joining said second panel to the enclosure side for pivotal movement relative thereto,

a third hingedly supported panel covering a portion of said first and second panels to close the space therebetween to form the enclosure side,

a third hinge means supporting said third panel for pivotal movement from a position out from contact with said first and second panels into a position in overlying contact with at least a portion of said first and second panels, and

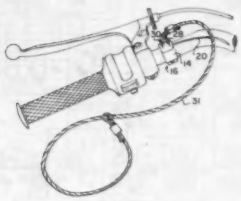
means for preventing pivotal movement of said third panel when said third panel is in overlying contact with said portions of said first and second panels thereby preventing pivotal movement of said first and second panels.

4,037,683

MOTORVEHICLE SAFETY CUT-OUT SWITCH

Gene LeBell, 1260 Hayworth Ave., No. 10, Los Angeles, Calif. 90046

Filed Oct. 20, 1975, Ser. No. 623,595
Int. Cl.[2] B60K *28/00*
U.S. Cl. 180—99 **1 Claim**



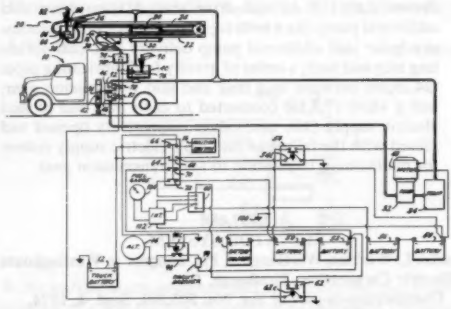
1. A safety cut-out switch for a motorvehicle ignition system comprising: a switch spring biased in a closed position; Means for connecting said switch to said ignition system to cut out said ignition system when said switch is closed; a spherical body; a housing for said switch rigidly secured to said motorvehicle, said housing including retaining means having a flaired and resilient opening for receiving and releasably holding said spherical body, and having means for opening said switch in response to the presence of said spherical body within said housing; and a lanyard having one end thereof connected to said spherical body and the other end adapted to be secured to a vehicle rider whereby said lanyard may pull said spherical body out of said housing by tension in a wide range of directions approximately hemispheric in angularity .

4,037,684

MOBILE LIFT APPARATUS WITH ELECTRIC POWER SYSTEM

Richard A. Moyer, Lansdale, and Joseph D. Patton, Chalfont, both of Pa., assignors to Asplundh Tree Expert Company, Willow Grove, Pa.

Filed Nov. 25, 1975, Ser. No. 635,222
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **9 Claims**



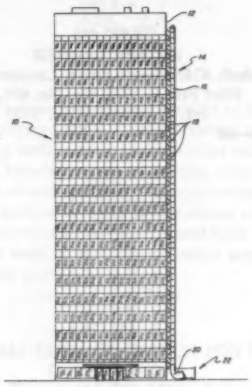
1. In combination a vehicle including an engine and a lift apparatus, said lift apparatus being operatively associated with a hydraulic control system inluding valve actuator means for controlling the operation of said hydraulic control system, said lift apparatus further including an electric motor operatively connected with pump means in said hydraulic control system and an electric power system for energizing said electric motor, said electric power system including battery means in series with said electric motor and switch means between said battery means and said electric motor, said switch means being operatively associated with said valve actuator means, said switch means being open when said valve actuator means is in an inoperative position and being movable to a closed position when said valve actuator means is operative, said electric power system further including master switch means for preventing the simultaneous operation of said vehicle engine and said electric motor.

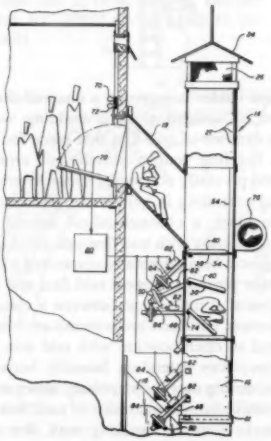
4,037,685

BUILDING EVACUATION SYSTEM

Anthony Talucci, 2045 Valley Drive, Syracuse, N.Y. 13207

Continuation-in-part of Ser. No. 613,338, Sept. 15, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,454
Int. Cl.[2] A62B *1/20*
U.S. Cl. 182—18 **13 Claims**





1. Apparatus for emergency evacuation of occupants from a multi-story building through openings in a side wall thereof, said apparatus comprising, in combination:

a. a substantially vertical, hollow tube extending in fixed, parallel relation to the building side wall;

b. means through which the interior of said tube communicates with the interior of the building at each floor thereof;

c. A plurality of platform means mounted at predetermined intervals along the length of said tube for movement

between blocking and unblocking positions wth respect to the interior thereof;

d. biasing means associated with each of said platform means urging the latter toward said blocking position and providing a biasing force opposing movement of said platform means away from said blocking position; and

e. means for automatically adjusting the biasing force on said platforms in response to the weight of an individual to provide a substantially constant rate of movement of said platforms to said unblocking position irrespective of the weight of the individual.

4,037,686

ESCAPE LADDER

Harold H. Shull, 6745 Florida Drive, Lantana, Fla. 33462

Filed Feb. 6, 1976, Ser. No. 691,992

Int. Cl.[2] E06C *1/383, 9/08*

U.S. Cl. 182—96 **6 Claims**

1. An excape ladder comprising a channel-shaped first side piece adapted to upstand along a building wall, mounting means on the exterior of said first side piece for mounting the latter to the building wall, a plurality of cross-pieces each having one end pivotally connected to the interior of said first side piece and extending in parallelism with each other from said first side piece, a channel-shaped second side piece in paralled facing relation with said first side piece, the other ends of said cross-pieces being pivotally connected to the interior of said second side piece to connect said first and second pieces together for parallel movement between a closed position in facing engagement with said cross-pieces enclosed within said side pieces and an open position with said side pieces spaced and said cross-pieces extending laterally between said side pieces, said mounting means comprising upper and lower arms extending laterally from the exterior of said first side piece for pivotal connection to the building wall, for swinging said ladder about a generally vertical axis toward and away from the wall, and detachable connection means connecting each of said arms to said first side piece for removably mounting the ladder to the wall, said detachable connection means each comprising a lateral end enlargement on the respective arm, said arms each having a reduced neck just inward of the end enlargement, and said first side piece having a relatively large through opening for receiving each of said enlargements, and a reduced upwardly extending opening for receiving the adjacent neck.

4,037,687

LUBRICATING MEANS FOR THE TRANSMISSION GEAR OF A SHIP

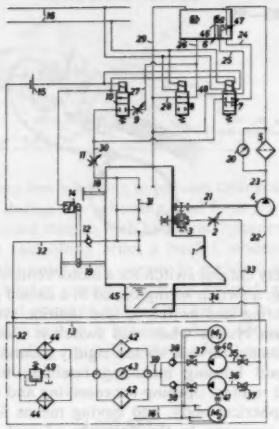
Wolfgang Krutz, Monchengladbach, and Hans Steinberg, Witten, both of Germany, assignors to Lohmann & Stolterfoht A.G., Witten, Germany

Filed May 11, 1976, Ser. No. 685,236

Claims priority, application Germany, June 10, 1975, 2526139

Int. Cl.[2] F01M *1/18*

U.S. Cl. 184—6.4 **6 Claims**



1. Lubricating means for the transmission gear **(1)** of a ship having a lubricating oil sump **(45)**, and a driven shaft **(19)**, at least one lubricating oil pump **(40)** having an intake **(34)** connected to said sump and a supply pipe **(32)** connected to said gear, an electric motor **(M1)** driving said pump, and a ship electrical supply system **(16)** connected to said motor; the improvement comprising:

an additional lubricating oil pump **(4)** having a drive shaft, a suction pipe **(22)** connected to said sump and a delivery pipe **(23)**; a clutch **(3)** between said additional pump drive shaft **(2)** and the transmission driven shaft **(19)**; a branch pipe **(33)** between said supply pipe **(32)** and said clutch **(3)** and transmission gear **(1)**; with normal pressure in pipe **(33)** maintaining said clutch disengaged; a fall in pressure in the main lubricating oil supply pipe **(32)** permitting engagement of said clutch kinematically connecting said driven shaft **(19)** to said drive shaft **(21)** to drive said additional pump **(4)**; a tank supported above said transmission gear; said additional pump delivery pipe **(23)** outletting into said tank; a series of gravity feed lubricating pipes **(24,25,26)** between said tank and said transmission gear; and a vlave **(7,8,10)** connected to each pipe and to said electric supply **(16)**, said valves respectively opened and closed with the failure of the ship's electric supply system for maintaining lubrication to said transmission gear.

4,037,688

ELEVATOR SYSTEM

Charles L. Winkler, Worthington, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 503,201, Sept. 4, 1974, abandoned. This application May 5, 1975, Ser. No. 574,829

Int. Cl.[2] B66B *1/18*

U.S. Cl. 187—29 R **78 Claims**

1. An elevator system for a building having a plurality of landings, comprising:

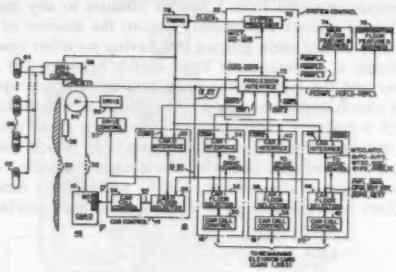
a plurality of elevator cars,

means mounting said plurality of elevator cars for movement relative to the landings,

up and down hall call registering means for registering calls for elevator service in the up and down directions, respectively, from at least certain of the landings,

car control means for each of said plurality of elevator cars, each of said car control means providing enable signals indicative of the landings, and service directions therefrom, the associated elevator car is capable of serving,

and supervisory control means responsive to said up and down hall call registering means and to the enable signals provided by each of said car control means, said supervi-



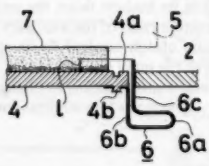
sory control means including storage means for storing said enable signals to obtain the building configuration existing at any instant, said supervisory conrol means effectively assigning calls for elevator service registered on said up and down hall call registering means to predetermined cars, using the building configuration stored in said storage means to determine which landings and service directions therefrom are currently in the building configuration, and which landings and service directions therefrom, each of the cars is capable of serving.

4,037,689

AUDIBLE ALARM SOUNDING TYPE PAD CLIP DEVICE FOR DISC BRAKE

Toshifumi Maehara, Iwatsuki, Japan, assignor to Akebono Brake Industry Company, Ltd., Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,629
Claims priority, application Japan, July 5, 1975, 50-94106[U]
Int. Cl.[2] F16D *66/02*
U.S. Cl. 188—1 A **5 Claims**



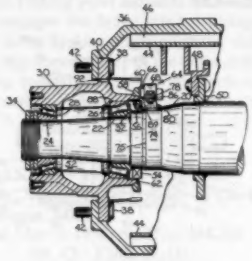
1. An audible alarm sounding pad clip device for disc brakes consisting of a side portion comprising an elongated U-shaped resilient member is adapted to be attached to the backing metal plate of a friction pad and includes a loop formed in the base portion of said resilient member and another side portion of the U-shaped member arranged to be resiliently in contact with the friction pad guiding face of a support with the end of the same side portion extending to a point coinciding with an allowable limit of wear of the lining of said friction pad.

4,037,690

SENSOR MODULE BRACKET

Frank H. Fisher, Kenton, Ohio, and Raymond John Jovick, Troy, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1975, Ser. No. 621,216
Int. Cl.[2] B60T *8/12*
U.S. Cl. 188—181 R **10 Claims**



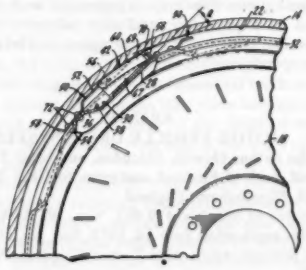
1. A bracket for mounting a sensor module to a veicle axle comprising an elongated body, a center portion of said body having a mounting surface adapted for contact with a surface of said axle and locating means projecting away from said surface, each end of said body being spaced radially outward from said center portion and adapted to mount one end of a sensor module, intermediate portions of said body connecting each of said body ends to said center portion and means for securing said center portion to said axle.

4,037,691

CENTRIFUGAL LOCK UP CLUTCH FOR FLUID COUPLINGS

John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 2, 1976, Ser. No. 646,301
Int. Cl.[2] F16H *41/18;* **F16D** *43/14*
U.S. Cl. 192—3.31 **7 Claims**



1. An engaging mechanism having first and second relatively rotating members, said first member comprising an annular shell, a series of ramps formed on said annular shell, a plurality of friction devices mounted between said ramps and said second member, cam means on said ramps in engagement with said devices, said devices having a frictional surface thereon, centrifugal force acting to urge said devices to move into engagement with said second member at a given speed of rotation to lock said members for rotation together, said cam means acting after initial engagement to wedge said devices between said ramps and said second member to increase the torque capacity of said engaging mechanism, said series of ramps being defined by forming said shell to provide a ramp

area extending axially from said annular shell and forming said ramps inwardly in said ramp area.

4,037,692

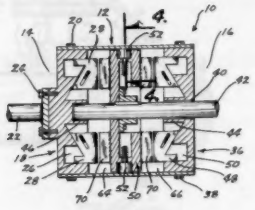
SPEED RESPONSIVE FLUID COUPLING AND CLUTCH

Douglas F. McFarland, Davis City, Iowa 50065

Filed Feb. 12, 1976, Ser. No. 657,453

Int. Cl.[2] F16H *41/18;* F16D *43/14*

U.S. Cl. 192—3.31 **7 Claims**



7. In a fluid coupling comprising,

a housing means having first and second ends,

a vane support means secured to said first end of said housing means for rotating said housing means and having inner and outer ends,

a power input shaft secured to said vane support means,

an output shaft rotatably extending into said housing means through one end thereof,

a clutch support means rotatably mounted on said output shaft in said housing means for rotation with said output shaft,

said housing having a fluid compartment between the inner end of said vane support means and said clutch support means,

movable vanes mounted on said inner end of said vane support means,

said movable vanes normally in an inoperative position but being movable into said fluid compartment at a predetermined time to cause the fluid therein to be revolved whereupon said clutch support means will be rotated,

and a movable clutch means on said clutch support means, said clutch means normally being in a disengaged position but being movable into engagement with said housing means at a predetermined time whereby said housing means and said clutch support means will be rotated at the same speed.

4,037,693

MOTOR VEHICLE DRIVE SYSTEM

Roger John Arthur Hewitt, Abingdon, and Nigel Terence Cross, Sheffield, both of England, assignors to GKN Transmissions Limited, Birmingham, England

Continuation of Ser. No. 419,982, Nov. 29, 1973, abandoned. This application July 14, 1975, Ser. No. 595,991

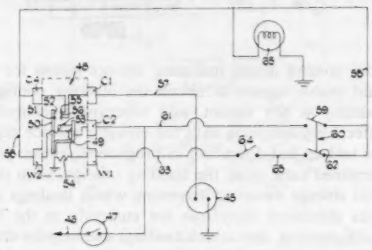
Claims priority, application United Kingdom, Nov. 29, 1972, 55199/72

Int. Cl.[2] B60K *41/22;* F16H *37/00*

U.S. Cl. 192—3.56 **7 Claims**

1. The combination in a motor vehicle of a prime mover, a multi-speed main gearing provided with a manual ratio selector means movable from a neutral position to any one of a number of operative positions equal to the number of ratios available in said main gearing but having no other operative positions, a disengageable main clutch between the prime mover and the input to the main gearing, a driver operated main clutch control having a first position in which the main clutch is engaged to transmit drive from the prime mover to the main gearing and a second position in which the main clutch is disengaged and which is normally assumed during ratio changes of the main gearing by said selector means, an auxiliary two ratio gearing in series with the main gearing, and ratio control means for the auxiliary gearing operable in dependence solely on the positions of the main clutch control and the manual ratio selector means so that, whenever the main gearing is in its highest ratio, the only action required to change the operative ratio of the auxiliary gearing is the movement of the main clutch control to its second position, each said movement of the main clutch control to its second position actuating the ratio control means to change the operative ratio of the auxiliary gearing while simultaneously disengaging the main clutch.

3. The combination in a motor vehicle of a prime mover; a multi-speed main gearing provided with a manual ratio selector means movable from a neutral position to any one of a number of operative positions equal to the number of ratios available in said main gearing but having no other operative positions; a disengageable main clutch between the prime mover and the input to the main gearing; a driver operated main clutch control having a first position in which the main clutch is engaged to transmit drive from the prime mover to the main gearing and a second position in which the main clutch is disengaged and which is normally assumed during ratio changes of the main gearing by said selector means; an auxiliary two ratio gearing in series with the main gearing, said



auxiliary gearing being of the epicyclic type which provides a direct drive ratio and a planetary ratio; and ratio control means for the auxiliary gearing and operable in dependence solely on the positions of the main clutch control and the manual ratio selector means said ratio control means including (1) a hydraulic circuit having an outlet which is controlled by an electrically operated valve, said outlet being arranged when closed to pressurize said circuit thereby engaging the planetary ratio of the auxiliary gearing and (2) a relay arranged to control operation of the electrically operated valve, said relay being arranged to be activated, and hence the electrically operated valve closed, on the first movement of the main clutch control to its second position after the higest ratio of the main gearing has been engaged, the relay being deactivated, and hence the electrically operated valve opened, on subsequent movement of the main clutch to its second position, so that whenever the main gearing is in its highest ratio, the only action required to change the operative ratio of the auxiliary gearing is the movement of the main clutch control to its second position, each said movement of the main clutch control to its second position actuating the ratio control means to change the operative ratio of the auxiliary gearing while similtaneously disengaging the main clutch.

4,037,694

DRIVE AXLE OUTER END WITH BRAKE AND GEARING

Beverly W. Keese, Neenah, Wis., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed July 21, 1975, Ser. No. 597,643

Int. Cl.[2] B60K *29/02*

U.S. Cl. 192—4 A **4 Claims**

1. An axle outer end assembly comprising:

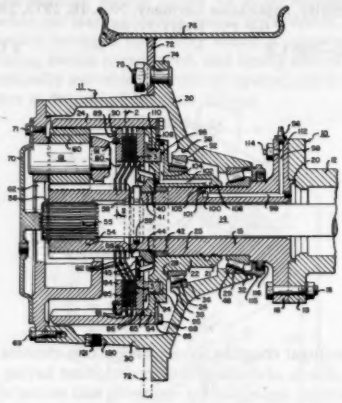
a hollow spindle,

an axle shaft projecting from said spindle,

an output member rotatably mounted on said spindle,

a planetary drive operably connecting said axle shaft and said output member, said planetary drive including a ring gear having a set of teeth, said gear being fixed to said spindle and a plurality of pinion gears engaging the teeth at one end of said ring gear,

a disc brake comprising a plurality of axially movable discs having projections extending radially outward into engagement with the teeth at the other end of said ring gear



and second axially movable disc means comprising at least one disc intermediate adjacent ones of said first plurality of discs, said second disc means being non-rotatably secured to an element of said planetary drive,

abutment means preventing axial movement of said discs and disc means beyond a predetermined point, and

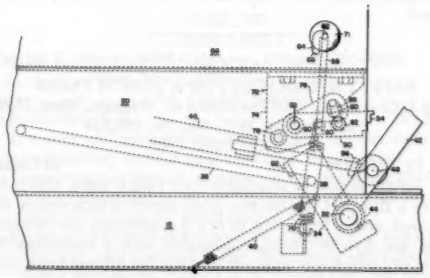
brake actuating means operative to move said discs and disc means axially toward said abutment means and into frictional contact with one another whereby said element and said output member are restrained against rotation.

4,037,695

INTERLOCK FOR A VEHICLE BRAKE AND CLUTCH CONTROL

Arnold Emil Welck, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 13, 1975, Ser. No. 604,166
Int. Cl.[2] F16D 67/02
U.S. Cl. 192—13 R **8 Claims**



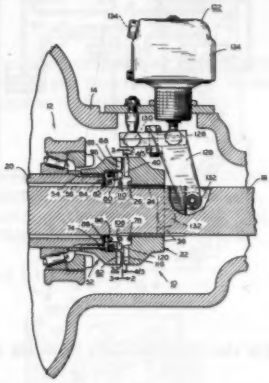
1. In a vehicle traction drive clutch and brake control of the type including clutch and brake control linkages exclusive of each other respectively including pivotally mounted clutch and brake pedals with the clutch pedal being pivotable between a normal drive establishing position and an actuated drive disestablishing position and with the brake pedal being pivotable between a normal brake-release position and an actuated brake-engage position, and a parking lock control linkage mounted for selective movement into engagement with the brake control linkage for locking the brake pedal in its actuated position, the improvement comprising: actuating means operatively interconnected between the parking lock control linkage and the clutch control linkage for locking the clutch pedal in its actuated position in response to the parking lock control being moved to lock the brake pedal in its actuated position; said parking lock control linkage including a first pivotally mounted locking pawl movable between a lock position, wherein it engages the brake control linkage and holds the brake pedal in its brake-engage position, and an unlock position wherein it is disposed free of the brake control linkage; and said actuating means includes an interlock member connected to said first locking pawl for movement therewith.

4,037,696

DYNAMIC TOOTH CLUTCH

Noah Alvin Shealy, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 7, 1976, Ser. No. 684,326
Int. Cl.[2] F16D 11/00
U.S. Cl. 192—48.5 **21 Claims**



1. An improved dynamic tooth clutch comprising:

a. a pair of opposed annular members each of which has a series of equally angularly spaced axially extending teeth thereon, the teeth of said members being adapted to intermesh with clearance, so that when said teeth are in mesh, limited relative rotation can take place between said members, with the radial extent of the teeth of one of said members being greater than that of the teeth of the other of said members;

b. a cam ring concentric with said other member;

c. complementary retaining and control means on said cam ring and said other member such that said cam ring can rotate relative to said other member by a predetermined angular amount in either direction from a position in which it is centered relative to said other member, said control means also including yieldable means for biasing said cam ring toward its centered position;

d. a series of axially extending teeth on said cam ring adapted to intermesh with clearance with said teeth of said one member, so that when said teeth of said one member are in mesh with said teeth of said cam ring, limited relative rotation can take place between said one member and said cam ring, with the axial clearance between the outer axial end faces of the teeth of said annular members being less than the axial clearance between the outer axial end faces of the teeth of said one member and the outer axial end faces of the teeth of said cam ring, so that the tooth axial end faces of said annular members can axially abut whilst there is still axial clearance between the tooth axial end

faces of said one member and the tooth axial end faces of said cam ring; and

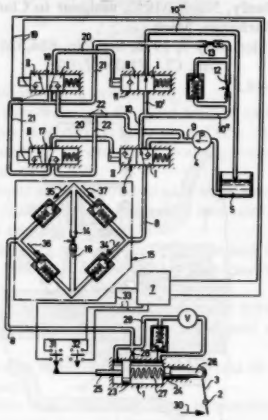
e. means for effecting relative axial displacement between said one member on the one hand and said other member and said cam ring on the other hand to effect meshing engagement between the teeth of said annular members and between the teeth of said one member and the teeth of said cam ring.

4,037,697

HYDRAULIC CLUTCH ACTUATING SYSTEM

Karl Prenzel, Neu-Katzwang, Germany, assignor to Ardie-Werk, GmbH, Nurnberg, Germany

Filed Aug. 21, 1974, Ser. No. 499,539
Claims priority, application Germany, Aug. 21, 1973, 2342234
Int. Cl.[2] A16D *25/00*
U.S. Cl. 192—91 R **6 Claims**



1. Means for electrohydraulically actuating a clutch comprising:

a fluid reservoir;

a source of pressurized fluid;

hydraulic actuating motor means for actuating said clutch;

fluid carrying means connected to said hydraulic actuating motor, said fluid reservoir and said source of pressurized fluid to provide pressure fluid to actuate said hydraulic motor means;

said fluid carrying means connected to said hydraulic actuating motor means comprise first and second discharge lines disposed in parallel relation communicating with said reservoir and said hydraulic actuating motor means;

fluid actuated control valve means connected with said fluid carrying means to control a flow of pressure fluid with respect to said hydraulic actuating motor means;

said fluid actuated control valve means comprise:

a fluid actuated shut-off valve in said second discharge line; and

first viscosity-independent flow regulator means in said first discharge line;

first electrically actuated control valve means connected with said fluid carrying means and said fluid actuated control valve means to control said fluid actuated control valve means;

viscosity-independent flow regulator means operatively connected in said control valve means to regulate fluid flow with respect to said hydraulic motor means;

electrical means to control said electrically actuated control valves means; and

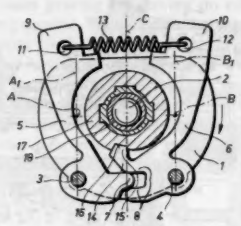
means connecting said first electrically actuated valve means to said electrical means to actuate said first electrically actuated valve means.

4,037,698

CENTRIFUGAL COUPLING

Albert Rix; Hans Fuchs, and Jens Onuscheit, all of Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Oct. 3, 1974, Ser. No. 511,914
Claims priority, application Germany, Nov. 10, 1973, 2356247
Int. Cl.[2] F16D *23/10*
U.S. Cl. 192—105 CE **8 Claims**



1. A centrifugal coupling, comprising a first element rotatable about an axis of rotation; a second element having a first coupling portion; and means for entraining said second element for joint rotation with said first element, including a pair of flyweights mounted on said first element for pivoting about respective pivot axes parallel to and equidistant from said axis of rotation, means for connecting said flyweights for simultaneous pivoting away from and toward one another between respective rest and coupling positions thereof, and at least one second coupling portion on one of said flyweights which engages said first coupling portion in said coupling position, each of said flyweights having a center of gravity and a plane defined by the latter and the respective pivot axis, and being acted upon, during the operation of the coupling, by mass-related forces reducible into said center of gravity and resolvable into first components located in said plane, and second components normal to said plane, said entraining means being so constructed that said planes of said flyweights extend parallel to one another in said coupling position and said second components of non-centrigual forces having the same magnitudes act on both of said flyweights in the same direction and result in equal but opposite forces at said connecting means which counteract each other so that said first and second components of said non-centrifugal forces cannot pivot said flyweights from said coupling toward said rest positions thereof.

4,037,699

SAFETY APPARATUS FOR A PUNCH PRESS

Peter J. Cronen, Jr., 2910 Fairchild Ave., Wayzata, Minn. 55391

Filed July 28, 1975, Ser. No. 599,334
Int. Cl.[2] F16D *7/00*
U.S. Cl. 192—134 **10 Claims**

1. Safety apparatus attachable to a punch press which includes a flywheel, an electric drive motor which drives the flywheel, and a triggering device for initiating the pressing cycle, the flywheel being engageable with a crankshaft by means of a selectively engageable clutch for driving a ram, said safety apparatus comprising:

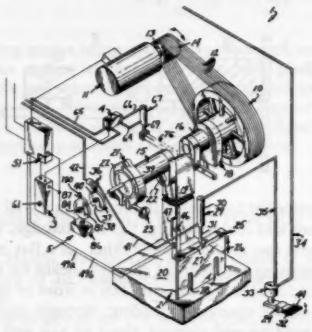
a. a drive and braking motor, said motor driving in one direction when power is supplied to the motor and imparting a braking force in a direction counter to the driving direction when the power supply to the motor is shut off;

b. means operably connected said drive-brake motor to the flywheel on the punch press for driving and braking the motion of the flywheel;

c. starting swtich means movable between an open and a closed position for intermittently transmitting power from a power source therethrough;

d. starting switch actuation means responsive to activation of the triggering device operable connected with the triggering device and with said starting switch means for moving said starting switch means between an open and a closed position when the triggering device is activated;

e. an energizable timing switch operably connected with said starting switch means so as to become energized when the starting switch means are actuated, said timing switch having a time delay which is initiated when said timing switch is energized, said timing switch being automatically movable between an opened and a closed position at the end of the time delay;



f. circuit means operably connecting the drive-brake motor with the starting switch means and a power source, for starting the motor when the starting switch means are actuated;

g. engagement means operably connected to said timing switch for positively engaging the clutch which interconnects the flywheel with the crankshaft, said engagement means movable from a disengaged to an engage position in response to the switching of said timing switch at the end of the time delay to thereby allow the flywheel to move the crankshaft through a pressing cycle; and

h. shut-off switching means operably attached to the crankshaft and said circuit means for shutting off power to said drive-brake motor after one pressing stroke of the ram has been completed, thereby causing said drive-brake motor to brake the motion of the flywheel to which it is connected.

4,037,700

COIN VAULT

Patrick T. Heraty, 3785 Columbus, Chicago, Ill. 60652

Filed June 1, 1976, Ser. No. 691,598

Int. Cl.[2] G07F *9/06*

U.S. Cl. 194—1 B **15 Claims**

1. A coin vault assembly for coin operated devices, including an upstanding hollow post anchored to a support, a coin receiving mechanism mounted to the top of the post and electrical conductor means for connecting a device to said coin mechanism for programmed operation,

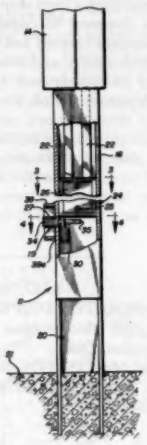
a port at the bottom of the post, a removable coin box within the post, said coin box having continuous sidewalls, a top and a bottom, an opening in the top of said coin box,

a coin chute extending from said coin mechanism and communicating with the opening in said top of the coin box,

a support means associated with the bottom of the coin box,

a locking member for said support member, and means in a sidewall of the post to hold the support member when the locking member is locked and to release the support member when the locking member is unlocked,

whereby said support member holds the coin box above the port thereby requiring the user to unlock the locking member by manual manipulation through the port so that



the said support member may be withdrawn from said holding means and the coin box may be dropped for removal from the post through said port.

4,037,701

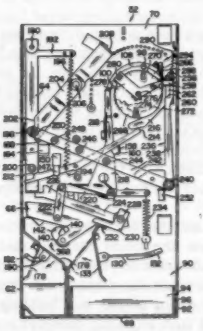
PRICE SETTER FOR TOTALIZER COIN MECHANISM

Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595

Continuation-in-part of Ser. No. 616,944, Sept. 26, 1975, abandoned. This application June 14, 1976, Ser. No. 696,129

Int. Cl.[2] G07F *5/08*

U.S. Cl. 194—1 L **6 Claims**



1. A coin controlled mechanism for use with a dispensing machine wherein the dispensing machine includes an access door to permit removal of articles from the dispensing machine and latch means attached to the access door to normally lock the access door in a closed position, said controlled mechanism comprising a housing attached to the dispensing machine, coin chute means arranged within said housing to receive coins inserted into said housing, an actuator means movably attached to said housing and disposed to lockingly engage the latch means when in a non-dispensing position and disengage the latch means when in a dispensing position, a totalizer means movable between a dispensing and non-dispensing position disposed in coin interrupted disposition relative to said coin chute means to advance from said non-dispensing to said dispensing position in response to coins fed through said coin chute means, said actuator means movable from said non-dispensing to said dispensing position to operatively engage said

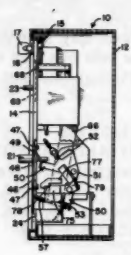
totalizer means and disengage the latch means to unlock the access door when said totalizer means is in said dispensing position relative to said actuator means and an adjustable price setter means comprising a limit stop movable between an upper and lower limit disposed to engage said totalizer means to control the movement thereof and variable adjustment means mounted on said housing, said variable adjustment means including an upper and lower limit means movably mounted on said housing independent of each other to selectively vary the relative distance therebetween, said limit stop coupled to a price control means movable between a first and second position by a quick change adjustment means movable between a first and second position to move said limit stop between said upper and lower linits, said upper and lower limit means disposed to engage said limit stop to control said upper and lower limits.

4,037,702

COIN OPERATED DISPENSING MACHINE

Jack Albert, Dayton, Ohio, assignor to American Lottery Equipment, Inc., Dayton, Ohio

Filed Mar. 15, 1976, Ser. No. 667,189
Int. Cl.[2] G07F *5/04*
U.S. Cl. 194—93 **2 Claims**



1. An interlock for a coin operated dispenser for preventing operation thereof until a predetermined number of coins of predetermined size are received therein, for enabling a single operation thereof when such coins are received, for collecting the predetermined number of coins, and for holding additional received coins and accepting them in the same number for each operation of the dispeners, comprising:

a. an inclined holding chute for receiving and containing the coins therein, said holding chute being open at both ends thereof,

b. a first blocking member for blocking the lower end of said chute to contain the coins therein, said first blocking member being movable to release the coins for collection from said chute when the dispenser is operated,

c. means forming a slot across said holding chute at a distance from said first blocking member equal to approximately the sum of the diameters of the predetermined number of coins to be received therein,

d. a second blocking member movable into said slot in said chute when the dispenser is operated to separate the coins beneath from those above said slot and to prevent those above from moving downwardly through said chute as said first blocking member unblocks the lower end thereof during operation of the dispener,

e. means biasing said second blocking member toward movement into said slot through the position occupied by the uppermost of the predetermined number of coins when they are stacked in said chute on said first blocking member,

f. stop means for engaging and stopping movement of said second blocking member when it begins to move through said uppermost coin position, and

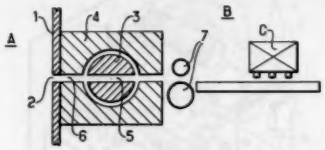
g. means causing second blocking member to engage the upper edge of the uppermost coin, when present, to cause said uppermost coin to cam said second blocking member up and over said stop means to permit said second blocking member to enter fully into said slot when the predetermined number of said coins of predetermined size is present therebeneath in said chute.

4,037,703

BLOCKING DEVICE FOR CARD OR VOUCHER READERS DESIGNED FOR PUBLIC USE

Andre Michaud, Chatenay Malabry, and Bernard Chalus, Arpajon, both of France, assignors to Transac - Com; agnie Pour le Developpment des Transactions Automatiques, Paris, France

Filed Dec. 12, 1975, Ser. No. 640,298
Claims priority, application France, Dec. 20, 1974, 74.42225
Int. Cl.[2] G07F *7/00*
U.S. Cl. 194—97 R **3 Claims**



1. In a device for blocking a slot formed in a wall separating two mediums and for permitting the free passage, in an open position, from one medium to the other, of a flat object, said device comprising a cylindrical element, means for supporting said element for rotating about its axis in front of said slot, an elongated radial opening extending through said element, means for rotating said element about its axis and means for stopping rotation of said element in predetermined angularly spaced positions, the improvement comprising a guide block including a cylindrical opening receiving said cylindrical element and supporting said cylindrical element for rotation about its axis, said block including a passage extending therethrough from said wall and intersecting said element for alignment with the radial opening of said element, and wherein said means for rotating said cylindrical element comprises means for rotating said element in a single direction from position to position and through 360°; whereby, a cord attached to the card for effecting fraudulent passage of the flat object first in one direction through said passage from one side of the block to the other and through said aligned radial opening of said element wherein said opening of said element is aligned with said passage of said block and for subsequent passage in the opposite direction, wraps itself about the cylinder and blocks the passage to prevent the card from being recovered in an unauthorized fashion.

4,037,704

ACTUATOR FOR A WIRE MATRIX PRINTER AND METHOD OF MAKING

Gary L. Golobay, Valley Center, and Robert L. Schrag, Wichita, both of Kans., assignors to NCR Corporation, Dayton, Ohio

Filed July 3, 1975, Ser. No. 593,082
Int. Cl.[2] B41J *3/04*
U.S. Cl. 197—1 R **6 Claims**

1. An actuator for a wire matrix printer comprising:

a frame means;

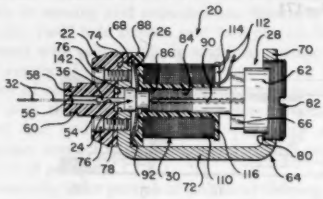
a plunger means having opposed abutment areas thereon and being mounted in said frame means for reciprocal movement between first and second position therein, and a print wire fixed to said plunger means to travel therewith;

a spring means having opposed fingers operatively connected to said opposed abutment areas on said plunger means to bias said spring means when said plunger means is moved to said first position;

magnet means producing a magnetic effect for attracting said plunger means toward said first position and for

holding it in said first position against the bias of said spring means, and also having abutment areas thereon;

means for producing a neutralizing flux which neutralizes said magnetic effect of said magnet means enabling said spring means to accelerate said plunger means towards said second position; and

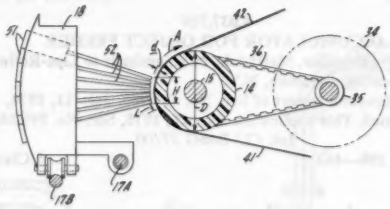


said spring means being operatively disconnected from said plunger means after accelerating said plunger means towards said second position by having said spring means engage said abutment areas on said magnet means to thereby enable said plunger means to travel ballistically at least part way towards said second position.

4,037,705
DESCENDER PRINTING SYSTEM FOR DOT MATRIX PRINTER

Donald P. Martin, Buffalo Grove, and Richard G. Ryan, Elmhurst, both of Ill., assignors to Extel Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 624,054, Oct. 20, 1975, Pat. No. 3,990,559. This application Apr. 9, 1976, Ser. No. 675,566
Int. Cl.² B41J *19/92, 3/04*
U.S. Cl. 197—1 R **7 Claims**



1. In a dot matrix printer of the kind comprising a print head, including a plurality of print elements disposed in a vertical array, for printing characters on a record sheet supported upon a platen in a format $m \times n$ of m horizontal column increments and n vertical row increments, a carriage for moving the print head across the record sheet in a horizontal printing direction with the lowermost printing element normally aligned with a horizontal base print line on the record sheet, and control means, including a FIFO input store, for actuating the print elements and the carriage in response to a received signal including a series of code words representative of characters to be printed and of other functions of the printer, the improvement comprising:

descender decoder means for decoding code words representative of descender characters that include descender components to be located below the base print line, prior to printing;

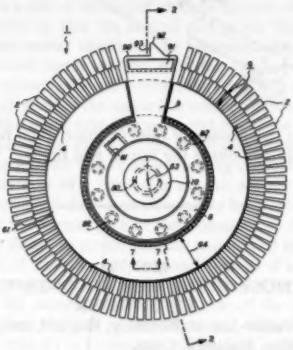
descender shift means, coupled to the descender decoder means, for shifting the record sheet upwardly through a distance L equal to p row increments, from a normal print position to a descender print position, thereby aligning p print elements below the base print line for printing each descender character, where $p < n$;

and shift reset means, included in the descender shift means, for shifting the record sheet downwardly through distance L from the descender print position to the normal print position, after completion of printing of a descender character, to permit printing a subsequent character entirely above the base line.

4,037,706
COMPOSITE PRINT WHEEL

Gordon Sohl, Richardson; David L. Bogert, Lewisville; Richard G. Crystal, Dallas, all of Tex., and Michael C. Weisberg, San Carlos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 509,193, Sept. 25, 1974, abandoned. This application May 6, 1976, Ser. No. 683,977
Int. Cl.² B41J *1/30*
U.S. Cl. 197—54 **29 Claims**



1. A print element for an impact printer comprising:

a metal alloy insert member having a plurality of beams extending radially outward from a center section, said center section having an opening in the center thereof and a plurality of apertures spaced around the center opening and positioned between the center opening and the beams,

character slugs molded to the ends of the beams, said character slugs having an impact surface engageable by hammer means for deflecting the character slug toward a record medium enabling a print surface on the slug to cooperate in a process for marking the record medium,

each of said character slugs including a print section and a capture section for coupling to the end of a beam whereby the energy imparted to the character slug by the hammer means is substantially reflected in stresses in the print section of a character slug rather than the capture section, and

plastic hub means having a plurality of projections, each of which extends through a respective one of the apertures in the insert member and coacts with the insert member to fixedly couple the hub means to the insert member,

said print element having an inertia of from about 6.4×10^{-4} in-oz-sec² to about 8.0×10^{-4} in-oz-sec².

4,037,707
CUP SHAPED PRINTER

Ta Cheng Ku, and Donald Joseph Stiles, both of Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,030
Int. Cl.² B41J *1/34*
U.S. Cl. 197—53 **3 Claims**

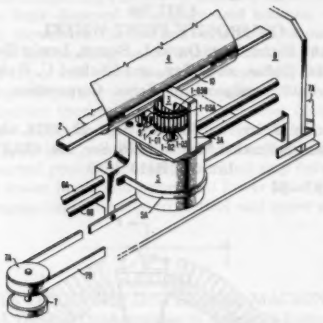
1. A print element for a serial printer which comprises:

a plurality of independent fingers, each of which has an axis and a first and a second end, a plurality of characters on said first end of each finger,

a central mounting element,

two semi-flexible non-stretchable parallel arms extending

from said central mounting element to the second end of each finger,



means to independently raise or lower each finger without substantially tilting the axis of said finger.

4,037,708

MULTICOLOR INK RIBBON CONTROL FOR A TYPEWRITER

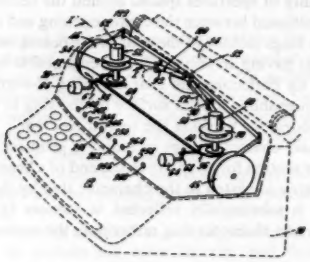
David A. Walker-Arnott, Bletchley, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,449

Claims priority, application United Kingdom, Feb. 5, 1975, 4950/75

Int. Cl.[2] B41J *33/20, 31/00*

U.S. Cl. 197—151 10 Claims



1. A typewriter ribbon system to enable selection of any specific longitudinal portion of a ribbon to be present in the operative impact area of the typewriter, comprising:

a ribbon including more than two longitudinal portions of different characteristics, each portion being separated from the other by a barrier portion, said ribbon extending from a first spool means on one side of said operative area to a second spool means on the opposite side of said operative area,

a ribbon drive means arranged adjacent each spool means and connectable thereto to drive a respective spool means, each said ribbon drive means being alternately operable to move said ribbon through said operative area, said ribbon drive means includes a motor and a clutch held between first and second resilient means, said motor and clutch being movable to move said clutch into and out of engagement with said spool means, and

a control means to operate said drive means to position a selected portion of said ribbon in said operative impact area.

4,037,709

RIBBON SPOOL WITH BUILT-IN BIFACIAL RE-INKER

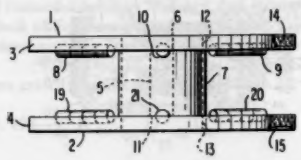
Eulogio Camacho Tibay, 1486 Castillo Park Subdivision, Almanza, Las Pinas, Rizal, Philippines

Filed Sept. 4, 1975, Ser. No. 610,350

Claims priority, application Philippines, Sept. 4, 1974, 16242

Int. Cl.[2] B41J *31/14*

U.S. Cl. 197—171 1 Claim



1. In a ribbon spool having a ribbon holder for holding ribbon wound thereon; a pair of fenders secured at the ends of said ribbon holder, said fenders each having faces disposed inwardly towards a ribbon wound on said holder, the improvement comprising: re-inker means provided on each of said fenders, said re-inker means having rollers rotatably mounted in each fender and slightly protruding at the inner faces thereof, an inking felt pad sealingly mounted in each of said fenders and said rollers comprising a series of segmented rollers rotatably supported in said fenders in communication with said felt pads, said rollers being positioned trisectionally on said fenders whereby ink from said inking pads is transferred to the edges of a ribbon wound on said ribbon holder in contact with said rollers during rotation of said spool which effectuates the winding and unwinding thereof to uniformly transfer ink to said ribbon by capillary action.

4,037,710

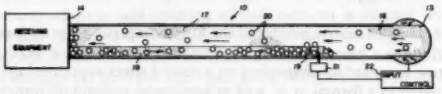
ACCUMULATOR FOR OBJECT FEEDER

Donald W. Brutcher, Mattydale, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 487,385, July 11, 1974, abandoned. This application July 28, 1975, Ser. No. 599,663

Int. Cl.[2] B65G *27/00*

U.S. Cl. 198—443 5 Claims



1. An object accumulator for a feeder having a vibrated pile material oriented to direct the flow of objects, a feed portions of said pile material being oriented to form a substantially direct object feed route from an input region to an output region, an accumulator portion of said pile material being arranged adjacent and alongside said feed portion at said output region and at the same level as said feed portion, and said accumulator comprising:

a. a removal portion of said vibrated pile material directly adjacent said feed portion at said output region and oriented relative to the vibration direction of said accumulator to move said objects generally rearwardly relative to the direction of motion of said objects in said feed portion of said output region so that objects crowded out of said feed portion in said output region are pushed onto said removal portion without resistance from the orientation of any of said pile material to prevent jamming if said objects in output region, and said crowded-out objects are moved generally rearwardly of said feed direction;

b. a re-entry portion of said vibrated pile material directly adjacent said feed portion upstream of and adjacent to said

removal portion and oriented in a direction extending toward said feed portion for receiving said crowded-out objects from said removal portion and moving said crowded-out objects back toward said feed portion;

c. said removal portion and said re-entry portion being oriented and dimensioned relative to the size of said objects and said vibration direction of said accumulator to cooperate in moving said crowded-out objects in a generally arcuate swirl held outside said feed portion by crowding contact with said objects in said feed portion of said output region, said swirl variably accumulating from one to many of said objects, the distance across said swirl varying with the number of said objects crowded into said swirl, and said objects in said swirl being in crowded-together contact with each other and with said objects in said feed portion;

d. the radially inner portion of said swirl forming a relatively short path of substantially minimum length for a relatively rapid re-entry to said feed portion for said crowded-out objects pushed just outside of said feed portion;

e. portions of said swirl radially outward from said inner portion forming relatively longer paths up to many times the length of said short path for relatively slower re-entry to said feed portion for said crowded-out objects pushed relatively far away from said feed portion; and

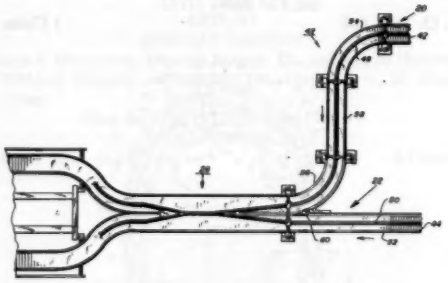
f. said swirl returning said crowded-out objects to said feed portion as soon as space in said feed portion is available.

4,037,711

ANTI-JAM CONVERGING APPARATUS FOR BAILED CONTAINERS FROM PLURAL CONVEYORS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed Oct. 23, 1975, Ser. No. 624,852
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—452 **9 Claims**



1. An anti-jam converging and metering apparatus in which containers carried on at least two conveyors are advanced in random order to a converging apparatus which receives these containers and by and with the forward propulsive motion of these containers actuates this apparatus so as to feed these containers one-at-a-time to a single line conveyor by which they are advanced to subsequent operations, said converging apparatus including: (a) at least two conveyors having length portions on which are provided side guide members and on these conveyors the containers are transported in an upright manner with at least one of the conveyors having its delivery end arranged to bring this conveyor toward and to the other conveyor to provide a Y-type converging portion; (b) a pivoted finger carried by a support means and in a manner so that the finger is easily moved in a plane substantially parallel to the plane of the conveyors, this pivot so positioned that the swinging end of the finger is normally directed toward the single conveyor, the swinging end of the finger being selectively movable to two extremes of movement and also in way of either of the paths of the containers carried on these converging conveyors, this finger so contoured and movably mounted that in each of the two extremes of movement the end is displaced so as to intrude into the path of a container on that conveyor over which the end of the finger is positioned while at this same time the pathway along the other conveyor is open to the flow of containers and when the finger is moved to the other extreme of movement the conveyor which was open to the flow of containers is closed while that conveyor previously blocked by the finger is now open for forward passage of containers; (c) an edge cam member provided on the outer side of a first conveyor and so formed and positioned as to tangentially engage a side portion of an advancing container on this conveyor and to move and guide this container in a path whereby at this same time the outer side of the displaced container engages a side of the finger to move the end of the finger around the pivot so that the moved end of the finger at this extreme of movement obstructs the pathway of a container along the second conveyor and with the finger in this first extreme of position the finger permits the container on the first conveyor to advance to the single line conveyor; (d) a lift plate provided on the outer side of the second conveyor this outer side being opposite the side adjacent the pivoted finger, said lift plate engaging a lower rim of an advancing container to slow the rate of advance of a container on this second conveyor when this container is displaced sidewardly by the finger when it is in way of the normal path of this container on the second conveyor, the finger so positioned and maintained in this position as a result of the prior presence and passage of a container on the first conveyor, and when the finger is in impeding condition on the second conveyor the side of the advancing container engages the side of the finger and when and while the finger is held by a container on the first conveyor this container on the second conveyor is displaced so that the rim is locally carried by the lift plate and with the passing of the container on the first conveyor the outer side guide and the forward urging of the conveyor causes the advancing second container to move the finger from this progress impeding position as soon as the container on the first conveyor has passed from finger engaging position, and (e) a contoured end on the swinging end of the finger, this contour so formed that in the extreme of movement of the pivoted finger the contour of the end in association with a guide side of the associated conveyor provides one side of a guided pathway which enables uninhibited passage of containers on a first conveyor and through the apparatus which containers on the second conveyor have not arrived at the pivoted finger and in the other extreme of movement of the contoured end of the swinging finger the opposite face of the finger provides a guided pathway along the second conveyor and uninhibited passage on this second conveyor through the apparatus when containers on the first conveyor have not arrived at the pivoted finger, the actuation of the finger being accomplished in response to the presence of and the forward propulsion of a container along one of the conveyors.

4,037,712

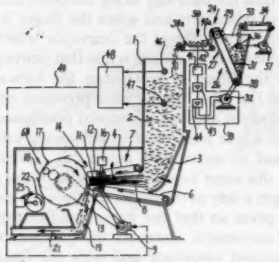
METHOD AND APPARATUS FOR SUPPLYING TOBACCO TO TOBACCO CUTTING MACHINES

Waldemar Wochnowski, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Jan. 30, 1976, Ser. No. 653,737
Claims priority, application Germany, Feb. 6, 1975, 2504902
Int. Cl.[2] B65G *43/08*
U.S. Cl. 198—524 **15 Claims**

6. Apparatus for supplying tobacco to at least one tobacco cutting machine having variable-speed prime mover means whose speed determines the output of said machine, comprising a container arranged to store a supply of tobacco; a metering unit having means for feeding to said container a continuous stream of tobacco at a substantially constant rate; means for transferring tobacco from said container to said machine; regulating means operable to vary the speed of said prime mover means so that the speed of said prime mover means

respectively increases and decreases when the volume of tobacco in said container respectively increases and decreases for reasons other than fluctuations in the rate of feed by said feeding means, particularly as a result of variations in temperature, moisture content and/or size of tobacco forming said stream; and means for operating said regulating means, including means for monitoring the volume of tobacco in said container.

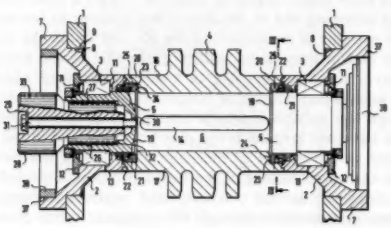


4,037,713

SCRAPER-CHAIN CONVEYORS

Mustafa Soliman, Lunen-Sud; Wulff Rösler, Altlunen; Jacob Spies, Dudweiler, and Klaus Herberg, Altlunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfaliar, Germany

Filed Mar. 22, 1974, Ser. No. 453,920
Int. Cl.[2] B60D *1/36;* F16H *1/00*
U.S. Cl. 198—725 31 Claims



1. A frame assembly for use with a scraper-chain conveyor; said assembly comprising:

a. a solid, continuous shaft with hollow end portions,

b. said shaft extending over substantially the entire width of the assembly,

c. a chain wheel carried by the shaft for rotation therewith,

d. two substantially identical bearing units having inwardly projecting parts with a frusto-conical region including a shoulder extending towards the center of the shaft into which the end portions of the shaft are received and are supported for rotation,

e. the bearing units being arranged symmetrically of the assembly,

f. means for supporting the bearing units with said shoulder of the bearing unit being engaged with the supporting means, and

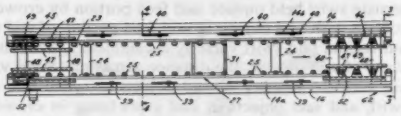
g. spline or key means within the hollow end portions of the shaft and journal coupling means having external locating means engageable with said spline or key means enabling the shaft to be selectively coupled to drive means whereby the shaft can be driven from either end.

4,037,714

RECIPROCATING CONVEYOR

Frederick W. Koepke, Livonia, Mich., assignor to Centri-Spray Corporation, Livonia, Mich.

Filed July 21, 1976, Ser. No. 707,427
Int. Cl.[2] B65G *35/00*
U.S. Cl. 198—750 10 Claims



1. In a conveyor having a frame, a transfer bar carried by the frame, the transfer bar having article supporting means thereon, and driving means for reciprocating the transfer bar on forward and return movements.

the improvement comprising:

an expandable and contractable section carried by the frame adjacent at least one end of the transfer bar, said section including a plurality of article supports relatively movable in the directions of forward and return movements of the transfer bar, said article supports forming a continuation of the article supporting means of the transfer bar; and,

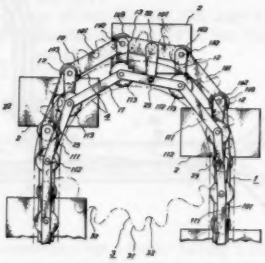
means for relatively moving said article supports to vary the spacing therebetween in response to forward and return movements of the transfer bar.

4,037,715

CHAIN CONVEYER SYSTEM

Katsuya Onishi, and Katsuyoshi Yoshida, both of Akashi, Japan, assignors to Yamato Scale Company, Japan

Filed Mar. 4, 1976, Ser. No. 663,668
Claims priority, application Japan, Apr. 18, 1975, 50-48052
Int. Cl.[2] B65G *17/12*
U.S. Cl. 198—800 1 Claim



1. A chain conveyor system, comprising a main roller chain stretched and driven along a predetermined transportation path, an auxiliary roller chain having the same pitch and same total length as said main roller chain and arranged in side by side relationship with said main roller chain and in a plane which is parallel to the plane in which said main roller chain is arranged, chain coupling links of equal effective length respectively coupling the roller shafts of said main roller chain to the roller shafts of said auxiliary roller chain, carriage supporting shafts respectively penetrating the links of said main roller chain rotatably at their midway points in the direction of said roller shafts and supporting carriages fixed thereto on the side opposite to the side of said auxiliary roller chain, coupling arms having the same effective length as said chain coupling links, one end of each of said coupling arms being fixed to said carriage supporting shafts respectively on the side of said auxiliary roller chain and the other end being pivoted at a midway point of a link of said auxiliary roller chain, whereby said chain

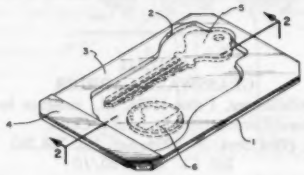
coupling links and coupling arms maintain a parallel orientation throughout the system, and inner and outer chain guides in contact with rollers of said auxiliary roller chain to control the path of said auxiliary roller chain and to maintain said chain coupling links at a predetermined angle with respect to the horizontal plane.

4,037,716

CARD KEY AND/OR COIN HOLDER

John D. Marks, 5077 Moordale Circle, Salt Lake City, Utah 84117

Filed June 21, 1976, Ser. No. 698,175
Int. Cl.[2] B65D *75/32;* **A45C** *11/00*
U.S. Cl. 206—38 **7 Claims**



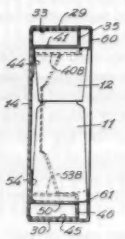
1. A transferable and portable card holder for keys, coins and/or similar items comprising a rigid card having a depressed region therein for receiving and securely and durably containing one or more items and a pressure resealable, at least partially adhesively-coated lid which covers the depressed region and which adheres to the non-depressed surface of the card, whereby the lid can be repeatedly opened and closed to expose the contained items by stripping the lid from the surface of the card.

4,037,717

DISPLAY CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Division - Champion Int. Corporation, St. Paul, Minn.

Filed July 23, 1975, Ser. No. 598,541
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **2 Claims**



1. A blank made of paperboard and adapted to be folded into a display carton of generally rectangular and tubular shape, comprising:

a substantially rectangular sheet of said paperboard, said sheet having opposed vertical lateral edges and opposed horizontal top and bottom edges;

four vertically spaced parallel hinge lines intermediate the lateral edges thereof defining a pair of side walls, a front panel, a back panel, and a manufacturer's glue flap positioned at one lateral edge thereof;

said side walls and said front panel having end closure flaps hingedly attached to the top and bottom edges thereof along said top and bottom horizontal edges;

said front panel having means for displaying the contents of the carton;

said back panel having a first rectangular flap hingedly attached along the bottom edge thereof;

said first flap having a bottom cushioning structure hingedly attached thereto along a horizontal fold line;

said bottom cushioning structure having a pair of elongated apertures formed therein aligned substantially perpendicular to said bottom edge of said back panel, each of said apertures having spaced apart inner and outer lateral edges;

said structure including a second flap hingedly connected along a horizontal fold line to said first flap and defined on the opposite side by a first intermediate fold line extending between the ends of said elongated apertures as well as a first pair of colinear fold lines spaced between the lateral edges of said structures and said outer lateral edges of said apertures;

said inner lateral edges of said apertures and said first intermediate fold line together with a second intermediate fold line spaced from said first intermediate fold line defining a center support panel;

said outer lateral edges of said apertures and said first pair of colinear fold lines together with a second pair of colinear fold lines parallel to said first pair defining a pair of restraining panels on either lateral side of said bottom cushioning structure; and

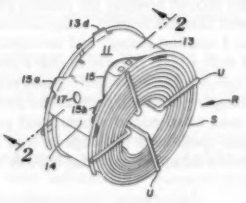
a glue flap connected to said center section along said second intermediate fold line and to said restraining panels along said second pair of colinear fold lines.

4,037,718

FILM RETENTION DEVICE

Paul Franklin Stiller, 23675 Smithtown Road, Excelsior, Minn. 55331

Filed Mar. 17, 1976, Ser. No. 667,495
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—53 **15 Claims**



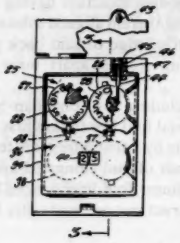
1. In combination, a film mounting reel and a film retention device therefore, said combination including:

a. a film mounting reel having a longitudinally extending core portion and a pair of longitudinally spaced film spacing elements arranged on said core portion, said film spacing elements including a sprially formed support member extending laterally from said core, the longitudinal spacing of said support members provided to receive the image area of the film therebetween;

b. the film retention device including a longitudinally extending, planar, body portion of a generally resilient material to allow forming thereof for placement thereof into said reel between said spiral supports thereof; and,

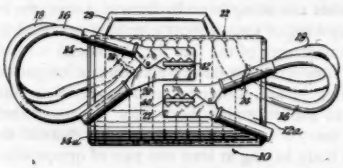
c. said body having at least one pair of oppositely directed, transversely extending tab elements, the transverse dimension of said tabs permitting the same to extend transversely into the spiral film supports of said reel for locking between adjacent of such spiral supports to retain the film against one of said spiral supports.

4,037,719
CIGARETTE COUNTING CASE
Alan Perlmutter, 120 Pitt Road, Springfield, N.J. 07081
Filed June 1, 1976, Ser. No. 691,559
Int. Cl.[2] B65D *85/10*
U.S. Cl. 206—266 1 Claim



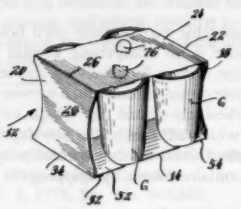
1. In a cigarette counting case, the combination of a first housing for containing a pack of cigarettes, a compartment in said first housing having a top opening and a bottom opening, said top opening being normally retained closed by an upwardly pivotable, spring-loaded top door, and said bottom opening being normally retained closed by a downwardly pivotable, spring-loaded bottom door, and said top door having a downwardly protruding post on its underside activating a counting mechanism contained in a second housing integrally formed on a front side of said first housing; said top opening including a pair of inwardly projecting tabs along a center of opposite longitudinal side edges thereof to prevent passage of a cigarette pack through said top opening into or out of said first housing thereby requiring usage of only said bottom opening for entering and removing a cigarette pack into said first housing, said second housing containing also a second counting mechanism that is manually operated; said mechanims each including a pair of intermeshing, numerically calibrated wheels behind a window opening on said second housing exposing aligned numerical calibrations of said pair of wheels, one said wheel having a knurled edge extending in a notch on an outer side of said second housing for manual resetting of said pair of wheels; said first mechanism being indicated with a text "cigarettes that I smoked today" and said second mechanism being indicated with a text "cigarettes that I smoked yesterday;" and said first mechanism, activated by said post, including a spring-loaded plunger pin which at its lower end bears against ratchet teeth of said knurl-edged wheel, said pin being slidable in a hole which opens on a top edge of said first housing, said pin at rest having an upper end that is flush with said first housing top edge.

4,037,720
BATTERY JUMPER CABLE CARRIER
Joseph McGurk, 121 NE 31st St., Pompano Beach, Fla. 33064
Filed July 26, 1976, Ser. No. 708,561
Int. Cl.[2] B65D *85/04;* H01B *7/06*
U.S. Cl. 206—328 5 Claims



1. In combination, a pair of battery jumper cables and a portable storage receptacle for the cables comprising:
a cable housing, said housing having an open end and a closed end surface, said closed end surface including an aperture receiving a cable;
a housing closure removeably mounted on the open end of said housing, said closure having at least one aperture for receiving a cable disposed therethrough;
a pair of electrical cables disposable within said housing, one end of said cables disposed through said housing closed end surface aperture and the opposite end through said closure aperture;
a battery terminal clamp coupled to each end of said electrical cables; and
cable slide preventing means coupled to said cable ends for retaining said closure adjacent one end of said cables and said housing closed end adjacent the opposite end of said cables to prevent relative movement of said closure and said housing relative to an intermediate portion of said cables.

4,037,721
GLASSWARE CARRIER
Joseph F. Schillinger, Palos Hills, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Sept. 30, 1976, Ser. No. 728,263
Int. Cl.[2] B65D *65/10*
U.S. Cl. 206—434 14 Claims

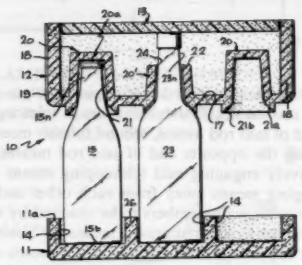


1. A receptacle for displaying and carrying glassware comprising:
a substantially rectangular parallelopiped sleeve having a top wall, a bottom wall, a pair of side walls, and an open front and rear surface, collapsible to a substantially flat configuration about hinge lines connecting said walls at their lateral edges,
a substantially upright divider wall secured to the interior of each of said top and bottom walls and extending between said pair of side walls,
a support panel secured between said bottom wall and the divider wall on each side of said divider wall and said top wall and the divider wall on each side of said divider wall,
each of said support panels being disposed at an acute angle with respect to the top and bottom wall to which it is secured and having at least one opening for receiving an item of glassware disposed between the openings adjacent said top and bottom walls on the same side of each of said divider walls,
means for pivoting each of said divider walls to a substantially flat condition on an adjacent top or bottom wall, and
means for locking said divider wall in a substantially upright position relative to an adjacent top or bottom wall.

4,037,722
PROTECTIVE PACKAGING FOR BOTTLES
Donald Bremer, 6303 Mojave Drive, San Jose, Calif. 95120
Filed Mar. 29, 1976, Ser. No. 671,590
Int. Cl.[2] B65D *81/04, 81/16*
U.S. Cl. 206—523 5 Claims

1. A protective packaging for bottles having different neck lengths, comprising:
a bottle support block having a plurality of bottle-base-receiving recesses therein, and

a generally box-shaped unitary bottle neck retainer having;
a. a generally planar web section forming the bottom of said retainer, the length and width of said retainer corresponding to the like dimensions of said support block,
b. sidewalls projecting upwardly from the periphery of said web section, and
c. a like plurality of bottle-neck-receiving inverted cups integrally attached to said web section in geometric conformity with the arrangement of said recesses in said support block, said neck-receiving cups also projecting



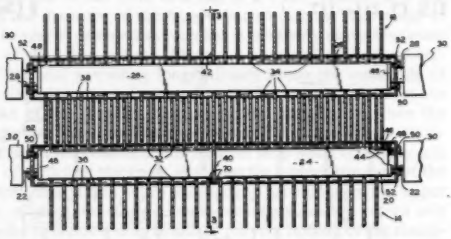
upwardly from said web section, the height of said sidewalls being greater than the height above said web section of said cups, said retainer being adapted to slip over the necks of bottles supported in said block, the upper portion of each cup extending above said web section and being individually flangible so as to accommodate a bottle having a neck of length greater than that received completely within one of said unbroken cups, said neck of greater length projecting through the opening in said cup exposed by breaking off the upper portion thereof.

4,037,723

DISK SEPARATOR

Harold F. Wahl, Portland, and James L. Keating, Boring, both of Oreg., assignors to Rader Companies, Inc., Portland, Oreg.

Filed May 2, 1975, Ser. No. 573,892
Int. Cl.² B07B *13/04*
U.S. Cl. 209—104 **6 Claims**



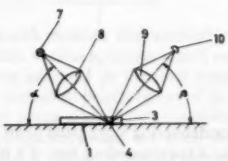
1. In an improved separator,
a first shaft,
a second shaft,
means journalling the shafts in parallel positions,
a plurality of first spacers slidable on the first shaft,
a plurality of first feed discs splined to the first shaft and positioned between the first spacers,
a plurality of second spacers slidable on the second shaft,
a plurality of second feed discs splined to the second shaft and positioned between the second spacers,
locating means for positioning said feed discs comprising,
first locating means fixed to the first shaft at a predetermined point along the length thereof,
second locating means fixed to the second shaft at a point therealong such that the second locating means is laterally aligned with the first locating means,
said first locating means being parallel to said first feed discs and extending radially around said shaft beyond the internal periphery of said spacers to form a stop abutment,
said second locating means being parallel to said second feed discs and extending radially around said shaft beyond the internal periphery of said spacers to form a stop abutment,
first retaining means pressing the first spacersand first feed discs snugly together and snugly against opposite sides of the first locating means,
and second retaining means pressing the second spacers and the second feed discs snugly together and snugly against the opposite sides of the second locating means.

4,037,724

METHOD OF AND APPARATUS FOR MEASURING DEFECTS IN SEALINGS

Peter Schultz, and Hinrich Martinen, both of, Quickborn, Germany, assignors to Firma Up Geratebau-und Vertriebs GmbH, Malente, Germany

Filed May 20, 1975, Ser. No. 579,208
Int. Cl.² B07C *5/342*
U.S. Cl. 209—111.7 R **5 Claims**



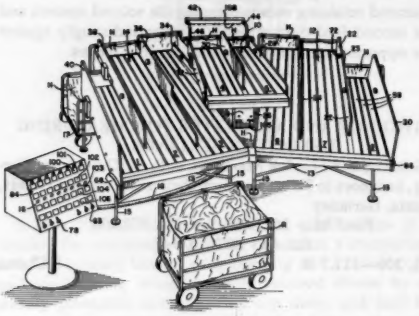
1. A method for measuring sealing material defects in a circular, ring-shaped sealing area of a container closure, said sealing area being located on the bottom, interior surface of an axially symmetrical closure, and said sealing area being coated with a sealing material, said sealing material having a different coefficient of reflectivity of light than said bottom interior surface at a predetermined wavelength, comprising the steps of:
a. selecting a wavelength such that there is a maximum difference between the reflectivity coefficients of said sealing material and said bottom interior surface of said closure,
b. positioning said closure in a predetermined control area;
c. illuminating a predetermined scan area of said sealing area of said closure with substantially monochromatic light pulses of said predetermined wavelength, the width of said predetermined scan area corresponding to the annular width of said sealing area;
d. maintaining said light pulses at a constant amplitude and correlating the pulse rate of said pulsed light to the rotational speed of said closure whereby an unbroken scanning of said sealing area is carried out,
e. detecting the level of the light of said predetermined wavelength reflected from said predetermined scan area;
f. rotating said closure by at least 360° about the axis of said ring-shaped sealing area so that the light reflected from said sealing area is progressively scanned over said entire sealing area;
g. comparing said detected light level with a predetermined value representing the reflected light level of an inadequately coated portion of said sealing area; and
h. ejecting said closure from said predetermined control area when said detected light level corresponds to said predetermined value, whereby closures having a defect in said sealing material coating over a portion of said sealing area are rejected prior to being applied to a container.

4,037,725

LAUNDRY SORTING MACHINE

Harold G. Roberts, 5905 Jimson Lane, and Robert J. Brooks, 3001 N. Deer Track Road, both of Tucson, Ariz. 85702

Filed Jan. 19, 1976, Ser. No. 649,932
Int. Cl.[2] B07C 7/00
U.S. Cl. 209—122 12 Claims



1. Apparatus for delivering segregated items of laundry from a sorting area into a corresponding one of a plurality of hampers within a discharge area, said apparatus comprising in combination:

a. a plurality of first conveyor means for conveying the items of laundry, said plurality of first conveyor means defining a fan like pattern from the sorting area to the discharge area, each of said first conveyor means including an input end disposed in proximity to the sorting area for receiving sorted items of laundry and located at a first level and including an output end disposed in proximity to the discharge area at a common discharge level for discharging the items of laundry into the hampers located therebelow, the input ends being close together and some of the output ends being separated to provide a space between the separated output ends of the first conveyor means in the fan like pattern;

b. a plurality of second conveyor means for conveying further items of laundry, said plurality of second conveyor means extending from the sorting area to the discharge area, each of said second conveyor means including an input end disposed in proximity to the sorting area for receiving sorted further items of laundry and located at a second level upwardly displaced from the first level and partially overlapping said closely spaced input ends of the first conveyor means and further including an output end disposed in a space between separated output ends of the first conveyor means at said common discharge level, the output ends of the second conveyor means in general horizontal alignment with the output ends of said plurality of first conveyor means for discharging the further items of laundry into the hampers; and

c. drive means for driving said plurality of first and second conveyor means;

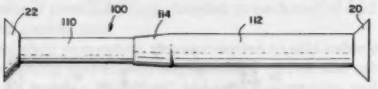
d. whereby an operator within the sorting area has ready access to the input ends of said plurality of first and second conveyor means and the output ends thereof are sufficiently laterally displaced to accomodate placement of hampers in proximity thereto.

4,037,726

MULTIPLE SECTION CURTAIN ROD

William Edwin Schweers, Maple Ridge, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 30, 1976, Ser. No. 746,069
Int. Cl.[2] A47H 1/022
U.S. Cl. 211—105.5 3 Claims



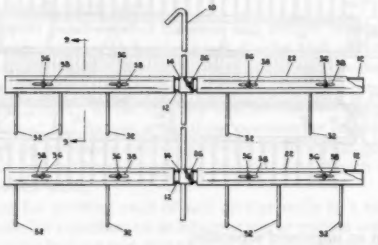
1. A resiliently biased telescoping curtain rod comprising center rod means, first tubular means telescopingly engaging one end of said rod means, second tubular means telescopingly engaging the opposite end of said rod means, resilient means operatively engaging said telescoping means for biasing said telescoping means away from each other and in an abutting relation with wall members to be spanned by said curtain rod, said resilient means comprising means for biasing both said first tubular means and said second tubular means away from each other, wall engaging means on the ends of said telescoping means for holding said curtain rod on wall members to be spanned by said curtain rod, collapsible and expandable curtain rod cover means surrounding said curtain rod and extending from one end of said first tubular means beyond said rod means and to the end of said second tubular means, said rod cover being adapted to receive curtain hook means, said rod cover comprising third tubular means surrounding and extending inwardly from the end of said first tubular means, a fourth tubular means telescopingly sliding over and receiving said third tubular means, the inwardly extending end of said fourth tubular means being gradually tapered towards the center of said third tubular means for slidingly moving curtain hook members over said rod cover.

4,037,727

ADJUSTABLE PAINTING OR PLATING RACK

Kenneth W. Kunkle, Grand Rapids, Mich., assignor to Pierce America, Inc., Grand Rapids, Mich.

Filed Jan. 2, 1976, Ser. No. 645,951
Int. Cl.[2] A47F 5/08; C25D 17/04
U.S. Cl. 211—117 9 Claims



1. An adjustable rack to hold objects that are to be plated or painted, said rack comprising:

a vertical support shaft;

a suspending means attached to the vertical shaft to support the rack from above;

at least one horizontal arm removably and adjustably attached to the vertical shaft;

fastening means removably connecting the horizontal arm to the vertical shaft to secure the horizontal arm in a fixed position with respect to the vertical shaft including a C-shaped clamp member, said C-shaped clamp member

having an aperture disposed horizontally off-center with respect to the clamp member, said C-shaped clamp member receiving within the concave shape thereof, the vertical shaft, and a removable fastener extending through a hole in the horizontal arm and the aperture in the C-shaped clamp member to clamp the horizontal arm to the vertical shaft;

a plurality of hooks intervally spaced along the horizontal length of the horizontal arm, and

a fastening means for removably and adjustably attaching the hooks vertically in a fixed position to the horizontal arm.

4,037,728

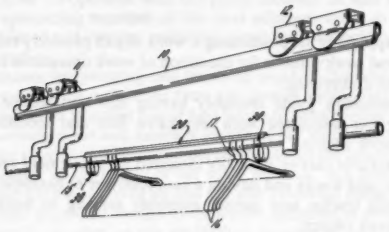
CLAMP FOR GARMENT RACKS

Anson W. Cameron, 945 Manor Drive, Wilmette, Ill. 60091

Filed Sept. 7, 1976, Ser. No. 721,036

Int. Cl.[2] A47F *5/00*

U.S. Cl. 211—124 **3 Claims**



1. In a clamping assembly for clamping garment hangers to a tubular horizontal hanger bar for transport, the combination comprising a longitudinally extending clamping bar extending along and parallel to the hanger bar, a clip adjacent each end of the clamping bar for holding the clamping bar captive on the hanger bar, each clip being formed of a spring band of resilient metal closed in a continuous loop and bent into an open figure eight configuration forming upper and lower lobes, the clamping bar being secured to the clips at the upper lobes thereof, each of the lobes being somewhat larger than the diameter of the hanger bar and with the spring band being deformed inwardly between the lobes to provide a central obstruction in the form of a gap of a width substantially less than the diameter of the hanger bar so that the movement of the hanger is detented as such bar is relatively moved between one of the lobes and the other, and a strip of resilient rubber-like material extending longitudinally along the underside of the clamping bar and secured to the latter to bear against the hooks of the garment hangers on the hanger bar when the hanger bar occupies the upper lobe of the clips during transport in loaded condition, the resilient strip being relatively soft and of sufficient thickness as to bias the hanger bar against the central obstruction when the hanger bar occupies the upper lobe of the clips during transport empty on the return trip thereby to insure a snug fit and to prevent rattling of the clamping assembly on the hanger bar.

4,037,729

DISPLAY APPARATUS

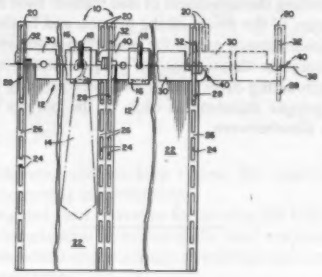
Frank Alfred DeSisto, Yonkers, N.Y., assignor to J. C. Penney Company, New York, N.Y.

Filed May 4, 1976, Ser. No. 683,187

Int. Cl.[2] A47B *9/00*; **A47F** *5/10*

U.S. Cl. 211—208 **5 Claims**

1. Display apparatus for supporting merchandise items which is detachably connected to at least a pair of vertically oriented and spaced apart shelf supporting members having a plurality of discrete slots formed therein, including a pair of end bracket means, each one having at least one projecting lug for detachable connection with the slots and having a pair of spaced apart openings; and first supporting bar connected to and between the bracket means includes latching means projecting from opposite end surfaces of the bar, each latching means is formed generally on the opposite side of a longitudinal axis of the bar from the other latching means and has notch means and forms a forward tongue portion which is adapted to removably and transversely extend through respective ones of the openings, the notch means are sized to enable vertical, longitudinal and tilting displacement of the bar relative to the bracket means for permitting the assembling and disassembling of the bar to the bracket means, the longitudinal displacement



defined by the notch means is dimensioned to enable it to not only accommodate various spacings which may exist between the bracket means mounted on the shelf supporting members, but also to limit undesired displacement of the bar by virtue of the notch means being selectively engageable with opposite sides of mounted bracket means, the latch means is at least of such a length which enables a second supporting bar having latching means to be inserted in or removed from the other of the openings in the bracket means and be in an overlapping position with respect to the first supporting bar without being obstructed by the latter.

4,037,730

PRESS LINE WITH WORKPIECE FEEDING DEVICE

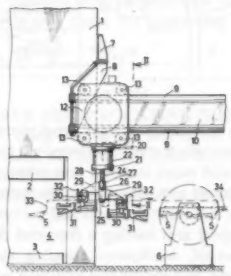
Helmut Fetzer; Franz Schneider, and Helmut Braitinger, all of Goppingen, Germany, assignors to L. Schuler GmbH, Germany

Filed Apr. 9, 1975, Ser. No. 566,194

Claims priority, application Germany, Apr. 9, 1974, 2417131

Int. Cl.[2] B65G *47/90*

U.S. Cl. 214—1 BB **14 Claims**



1. In combination with a press line having at least two presses, a transfer system transferring workpieces from a precessing station of one press to a processing station of a subsequent press, the transfer system comprising track means extending over the entire interspace between two successive presses, a single transfer slide means arranged for horizontal movement along said track means, at least one pair of gripper

members pointing opposite directions and mounted on said transfer slide means for at least lifting and lowering movements and operating movements to grip and release the workpieces, a single storage station for the workpieces being disposed between the two successive presses, transfer drive means for controlling the movement of said transfer slide means in accordance with the travel path of said transfer slide means, and a reciprocating drive means for lifting and lowering said gripper members along the travel path of said transfer slide means, said transfer drive means and said reciprocating drive means being separate and independent of one another and being independently controllable of one another, said transfer drive means for controlling the movement of said transfer slide means being independent of the drives of the presses, and further comprising program control means for providing a variable program for effecting coordinated control of said transfer drive means, said reciprocating drive means and the operating movements of said gripper members at each of the presses and during transfers therebetween.

4,037,731

WORKPIECE TRANSPORT APPARATUS

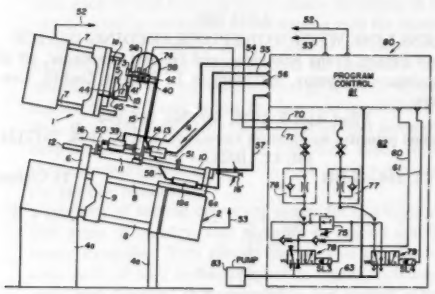
Walter Reis, Obernburg, and Dietmar Boll, Elsenfeld, both of Germany, assignors to Walter Reis, Obernburg, Germany

Continuation-in-part of Ser. No. 474,333, May 29, 1974, Pat. No. 3,924,754. This application Oct. 3, 1975, Ser. No. 619,468

Claims priority, application Germany, May 27, 1975, 2523442; May 27, 1975, 7516833[U]

Int. Cl.² B65G *47/90*

U.S. Cl. 214—1 BB **10 Claims**



1. Apparatus for transporting a workpiece from one work station to another work station in response to the operation of at least one of said work stations, comprising transport means including a tranport arm, means tiltably supporting said transport arm at one end thereof for pivotal movement about a first axis, said transport arm having a free end opposite said supported end thereof, workpiece gripping means, connecting means supporting said workpiece gripping means on said free end of said transport arm for pivotal movement about a second axis parallel to and displaced from said first axis, said connecting means comprising piston cylinder means secured between said free end of the transport arm and to said gripping means for relatively displacing said workpiece gripping means with respect to said transport arm linearly along said second axis, and control means operatively connected to said piston cylinder means.

4,037,732

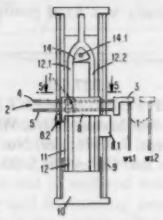
POSITIONING APPARATUS

Anthony William Orlando, Highland, and Frederick Arthur Schultz, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,312

Int. Cl.² B65G *47/90*

U.S. Cl. 214—1 BB **5 Claims**



4. Apparatus for positioning a work object precisely relative to plural work stations for execution of work operations at said stations comprising:

a stationary guide assembly having first and second cam tracks associated with respective first and second said work stations;

a movable carrier assembly mounted for movement relative to said tracks and having a cam follower engageable with said tracks; said carrier assembly serving to hold said work object;

a variably displaceable, multifaceted cam rotatably mounted about an axis located within the facets of the said cam and situated at a junction between said tracks; said cam facets being contacted by and displaced by said cam follower in the course of movemet of said carrier assembly for transporting said object from one to the other of said respective work stations; said cam further being effective when displaced to operate to guide said follower from following engagement with a respective one of said tracks to the other of said tracks, thereby positioning said object at the respective other station.

4,037,733

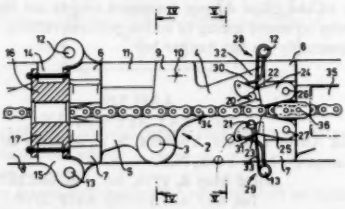
BAR HOLDER ARRANGEMENT FOR BAR STOCK MATERIAL TO BE FED TO A MACHINE TOOL

Ewart H. Doe, Houghton, near Stockbridge, and William J. Linforth, Chandlers Ford, both of England, assignors to Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H., Kiel, Germany

Filed July 29, 1975, Ser. No. 600,116

Int. Cl.² B23Q *5/22*

U.S. Cl. 214—1.5 **8 Claims**



1. A bar holder arrangement for holding bar stock material to be fed to a machine tool, said arrangement comprising:

a. a frame,

b. a plurality of levers each pivotably mounted on an elongated member on said frame,

c. each of said levers having at one of its ends an upstanding

member so formed as to present a semicircular recess and at the other of its ends a further upstanding member so formed as to present a semicircular recess,

d. a plurality of guide members each being so formed as to present a semicircular recess,

e. each of said guide members being pivotably mounted on a respective one of said upstanding members and said further upstanding members,

f. said guide members co-operating each with another of said guide members in pairs to define a plurality of circular receiving means for bar stock material and

g. the pivotal mounting of each of said guide members on its respective upstanding member being about a respective axis perpendicular to the longitudinal extent of the bar holder arrangement such that it is pivotable outwardly to permit passage, between the co-operating pairs of guide members, of a bar feed member having a diameter greater than the diameter defined by the circular receiving means of said pairs of guide members,

h. said levers being so disposed along said elongated member that the guide member on said upstanding member of one lever co-operates with the guide member on said further upstanding member of the next adjacent lever to define one of said circular receiving means for bar stock material, and

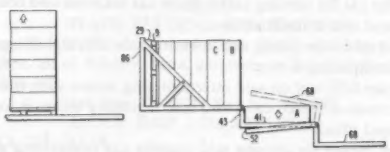
i. means for pivoting said levers to separate the upstanding member of each lever from the further upstanding member of an adjacent one of said levers to open the bar holder arrangement and enable a length of bar stock material to be moved, in a direction perpendicular to the longitudinal extent of the length of bar stock material, to a position in which it is received by said circular receiving means when said levers are moved to respective positions in which the guide member on the upstanding member of each of said levers abuts the guide member on the further upstanding member of an adjacent one of said levers to form said circular receiving means.

4,037,734

METHOD AND APPARATUS FOR DEPALLETIZING

Frank H. Erdman, Holmes Beach, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Filed Mar. 5, 1976, Ser. No. 664,366
Int. Cl.[2] B65G *59/06*
U.S. Cl. 214—8.5 A **26 Claims**



1. Depalletizing apparatus for unloading a pallet stacked with a plurality of layers of parallelepiped-shaped objects comprising:

a. a stationary main support frame;

b. a pivotable support frame mounted on said stationary main support frame for rotation about a horizontal axis;

c. means for placing a stacked pallet on said pivotable support frame;

d. means on said stationary main support frame for rotating the pivotable support frame together with the stacked pallet, 90° about its horizontal axis;

e. first holding means pivotably connected to said pivotable support frame adjacent the first, top layer of the stack, opposite the pallet, for rotation about a horizontal axis; means for rotating said first holding means together with said first layer 90° to a reclining position from an initial upright position; and

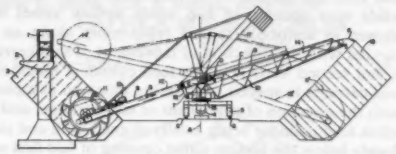
means for transferring said first layer of objects from said first holding means and for rotating said first layer of objects 180° about a horizontal axis so that said objects of said first layer assume the same orientation as when placed onto said pivotable support frame.

4,037,735

RECLAIMING AND STACKING SYSTEM

Heinz Althoff, White Plains, N.Y., assignor to Fried, Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Jan. 13, 1976, Ser. No. 648,823
Int. Cl.[2] B65G *65/28*
U.S. Cl. 214—10 **6 Claims**



1. A reclaiming and stacking system for conveying bulk material, comprising in combination:

a. an elongated yard conveyor for moving the bulk material in the longitudinal direction of the yard conveyor;

b. a rail-mounted undercarriage straddling transversely said yard conveyor;

c. first and second booms each having an inner end and an outer end;

d. means for supporting said first and second booms on said undercarriage at said inner ends;

e. first and second boom conveyors supported on and extending along said first and second booms, respectively, each boom conveyor having inner and outer ends;

f. a bucket wheel supported at said outer end of said first boom for removing bulk material from a pile spaced from and along said yard conveyor and discharging it onto said first boom conveyor at the outer end thereof;

g. a central chute supported in the zone of said undercarriage and having a discharge end oriented towards said yard conveyor;

h. the adjacent inner ends of the first and second boom conveyors being located so as to define a direct, unobstructed first path for the bulk material from the inner end of said first boom conveyor to the inner end of said second boom conveyor for providing a transfer of the bulk material by gravity directly from the first boom conveyor to the second boom conveyor; and

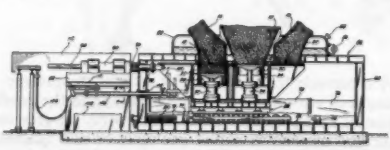
i. transfer means operable to define a second path for transferring bulk material from the inner end of said first boom conveyor into said chute for deposition onto said yard conveyor.

4,037,736

DUAL CYLINDER RECIPROCATING SOLIDS FEEDER

John R. Pownall, Long Beach, and Harold E. Carver, Los Angeles, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed June 1, 1976, Ser. No. 691,633
Int. Cl.[2] F23K *3/00*
U.S. Cl. 214—23 **16 Claims**



1. A solids feeder for introducing particulated solids into a

solids upflow vessel having a bottom solids inlet opening, which comprises:

a horizontally movable carriage positioned below said solids upflow vessel;

carriage actuator means for reciprocating said carriage between first and second stationary positions;

first and second solids feed chutes communicating with an elevated solids feed reservoir for transporting particulated solids from said solids feed reservoir by gravity flow, each of said solids feed chutes terminating in a bottom outlet opening located at opposite sides of and in the same horizontal plane as the bottom solids inlet opening of said solids upflow vessel, and the bottom outlet openings of said first and second solids feed chutes and the bottom solids inlet opening of said solids upflow vessel being aligned in uniformly spaced relationship along an axis parallel with the direction of movement of said carriage;

first and second vertical solids feed cylinders mounted on said carriage in spaced relationship along an axis parallel with the direction of movement of said carriage, said first solids feed cylinder being axially aligned with and immediately below the bottom outlet opening of said first solids feed chute and said second solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel when said carriage is in said first stationary position, and said first solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel and said second cylinder being axially aligned with and immediately below the bottom outlet opening of said second solids feed chute when said carriage is in second stationary position;

a first solids feed piston movably mounted in said first solids feed cylinder;

a second solids feed piston movably mounted in said second solids feed cylinder;

solids feed piston actuator means for reciprocating said first and second solids feed pistons;

solids sealing means for sealing said bottom outlet openings of said first and said second solids feed chutes and the solids inlet opening of said solids inlet vessel when said first and second solids feed cylinders are not axially aligned therewith; and

control means for synchronizing the movement of said carriage and said first and said second solids feed pistons.

4,037,737

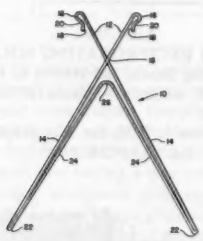
RACK STRUCTURE FOR SUPPORTING ARTICLES

James E. Stevens, 2495 Temple Hills Drive, Laguna Beach, Calif. 92651, and Randel C. Martin, 34106 Street of the Amber Lantern, Apt. C, Dana Point, Calif. 92629

Filed Jan. 30, 1976, Ser. No. 654,140

Int. Cl.[2] A47F 7/00; A47K 1/08

U.S. Cl. 211—106 **2 Claims**



1. A receptacle for generally flat articles comprising:

a length of wire rod conformed generally to the configuration of an equilateral quadrilateral with the free ends of the rod crossed to define one apex of said quadrilateral and provided with an article receiving pocket formed by revertively bending said rod generally at the side apices of said quadrilateral to bring into proximity to the rod-crossing apex of said quadrilateral the opposite apex thereof and having the free ends of the rod extend beyond the crossing equal distances and each end bent into the configuration of a hook for suspending the receptacle, the bending of the hook being in a direction transverse to the direction of the bends forming the article receiving pocket thereby to accommodate suspending one receptacle from another by engaging a hook of said one receptacle with a pocket forming bend of said other receptacle.

4,037,738

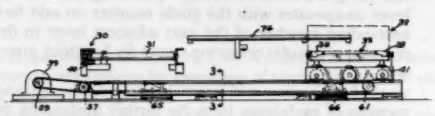
TRANSFER APPARATUS

Richard B. Johnson, Mount Airy, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Oct. 9, 1975, Ser. No. 621,135

Int. Cl.[2] B65G 47/04

U.S. Cl. 214—38 CC **11 Claims**



1. In an apparatus for transferring loads between a conveyor and a station, the combination comprising

a conveyor,

a transfer car,

means for supporting said car for movement between said conveyor and said station,

said car having interdigitating means thereon adapted to interdigitate with said conveyor when the transfer car is at a position adjacent said conveyor,

means for supporting and operating said interdigitating means for vertical movement such that said means may be moved upwardly to lift a load from said conveyor or said station and downwardly to lower said load on said conveyor or said station,

a power source positioned in fixed position relative to said conveyor and said station,

means extending between said power source and said transfer car for moving said transfer car between said conveyor and said transfer station,

said means for lifting and lowering said interdigitating means comprising a cam,

a cam follower on said interdigitating means such that upon rotation of said cam, said interdigitating means is lowered and lifted,

said means for driving said transfer car comprising a chain driven from a position adjacent said conveyor,

a first sprocket and a second sprocket,

said chain having one end thereof connected to one sprocket,

the other end of said chain being connected to another sprocket,

a shaft rotatably mounted on said transfer car,

said sprockets being mounted and fixed on said shaft,

means interconnecting said shaft and said first-mentioned cam,

a pair of cams on said shaft,

and latch means positioned along the path of the transfer car for selectively engaging one or the other of said pair of cams to hold the transfer car in position adjacent said conveyor and said transfer position, respectively, so that upon movement of said chain, one of said sprockets or the other of said sprockets is rotated to actuate the drive to said cams of said lifting and lowering means for lifting and lowering said interdigitating means.

4,037,739

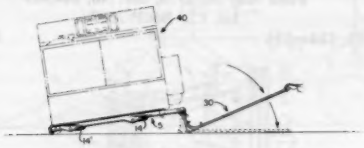
MOVING SYSTEM WITH INTEGRAL CASTERS

William S. Lee, New Orleans, La., assignor to Lee Inventions, Inc., New Orleans, La.

Division of Ser. No. 467,781, May 7, 1974, Pat. No. 3,918,597, which is a continuation-in-part of Ser. No. 189,337, Oct. 14, 1971, Pat. No. 3,809,261, which is a division of Ser. No. 9,223, Feb. 6, 1970, Pat. No. 3,633,774. This application Sept. 18, 1975, Ser. No. 614,546

Int. Cl.[2] B65G *67/02*

U.S. Cl. 214—38 CC 8 Claims



1. A moving apparatus for moving a heavy load having a portion of its bottom area offset from the surface on which it rests comprising;

a sled for positioning beneath the offset bottom area of the heavy load in juxtaposition thereto, said sled having first and second integral sets of heavy duty carriage members movably mounted thereon, said carriage members being drop-leaf casters which are rotatably mounted on said sled and have a raised, inoperative position and a lowered, operative position at a 90° angle with respect to each other, said casters being movable from one position to another by being rotated the 90°;

L-shaped leverage means for raising both ends of said sled so as to permit said first and second sets of carriage members to be moved into a lowered operative position under the heavy load, thereby enabling said heavy load to roll freely on the lowered carriage members, said leverage means provided with transportation means on said leverage means for transporting said sled on said leverage means; and

spring biased locking means on said drop leaf casters for locking said drop leaf casters in their respective operative and inoperative positions.

4,037,740

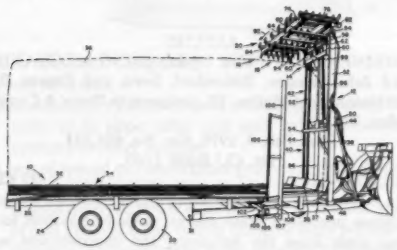
STACK FEEDING APPARATUS

William Robert Wood; Edward Clyde Ryan, and Marvin Lee Bigbee, all of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 28, 1975, Ser. No. 608,580

Int. Cl.[2] B60P *1/00;* A01F *29/00*

U.S. Cl. 214—83.14 19 Claims



1. An apparatus for unloading a harvested crop stack comprising: a mobile elongated stack carrier having front and rear portions; a mast at one end of the carrier; structure carried by the mast, movable between the ends of said mast, and extending therefrom to overlie said carrier; means for advancing the stack along the carrier to position a portion of said stack in underlying relation to said structure; a continuous powered conveyor carried by said structure and movable therewith, having upper and lower runs traversing paths transverse to the direction of stack advancement; and raking means including knife means carried by said conveyor for serving the underlying stack portion from the stack, and for progressively dislodging said portion during downward movement of the structure, and for transferring said disloged portion away from said stack.

4,037,741

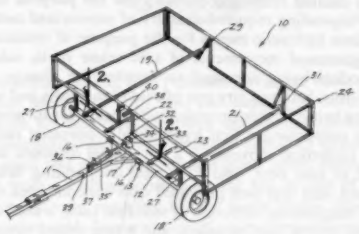
BALE TRANSPORTING AND FEEDING APPARATUS

Donald E. Smith, R.R. 3, Russell, Iowa 50238

Filed Feb. 4, 1976, Ser. No. 655,268

Int. Cl.[2] B66C *23/00*

U.S. Cl. 214—130 C 18 Claims



1. Hay handling apparatus comprising:

a frame adapted to be connected to prime mover;

wheel means rotatably attached to said frame along a substantially horizontal axis for allowing said apparatus to be towed from place to place;

an elongated member pivotally attached to the frame along a substantially horizontal axis;

a first shaft means rigidly attached to said elongated member;

a second shaft means rigidly attached to said elongated member, said first and second shaft means being substantially perpendicular with respect to the pivotal axis of the elongated member but non-parallel with respect to each other; and

means for pivoting said elongated member and thereby said first and second shaft means with respect to said frame.

4,037,742

PROGRAMME CONTROLLED HYDRAULIC LOADING CRANE

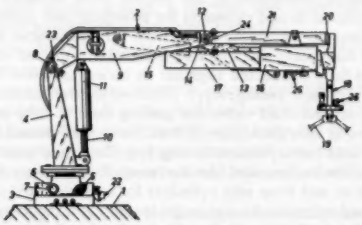
Hans Eric Karl Gustafsson, Saltsjoduvnas, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed Oct. 7, 1975, Ser. No. 620,267

Claims priority, application Sweden, Oct. 8, 1974, 7412624

Int. Cl.[2] E02F *3/32*

U.S. Cl. 214—138 R 4 Claims



1. An improved hydraulic loading crane comprising crane parts including a hydraulically rotatable crane post, an inner

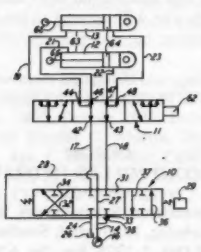
crane boom mounted at the upper end of said post for hydraulically operated pivotal movement in a vertical plane, a jib mounted at the outer end of said inner boom for hydraulically operated pivotal movement in a vertical plane, said jib provided with means for lifting a load, and an electroncially programmed control system comprising a memory, and a plurality of electrical encoders mounted on said crane and arranged, upon movement of said crane parts from a starting position to an end position and back, to register and store in said memory the change of positions between said crane parts which are movable relative to one another, a servo valve, and a comprising unit inserted between said memory and said servo valve and arranged, upon reading of said memory during the operation of said crane to compare signals stored in said memory with signals which are continuously emitted by said encoders to open said servo valve to values corresponding to the difference between said continuously incoming signals and the signals emitted from said memory for the purpose of feeding a corresponding required quantity of pressurized medium to the various hydraulic means for the purpose of obtaining the preprogrammed movements of said crane parts, said electrical encoders being arranged to register the change of angular positions between any one of said crane parts and said loading crane being further provided with means for turning said crane post comprising a first hydraulically operated rack arranged for reciprocal movement, a cog wheel disposed at the lower end of said post, said first rack cooperating with said cog wheel, said first rack provided with a second rack extending in the longitudinal direction of said first rack, a shaft arranged to drive one of said encoders, and a cog wheel mounted at one end of said shaft, said second rack engaging the teeth of said cog wheel.

4,037,743

MATERIAL HANDLING BUCKET DUAL CYLINDER SYSTEM

Carl Oluf Pedersen, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 14, 1976, Ser. No. 648,881
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—140 **4 Claims**



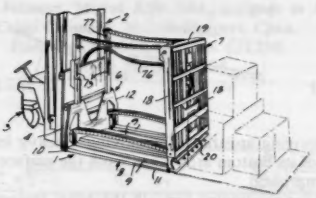
1. A material handling bucket dual cylinder system comprising two fluid cylinders connectable to a bucket for loading and dumping actuations of the bucket, fluid actuated apparatus connected to said cylinders for powering said cylinders in the loading and dumping actuations, said apparatus including a first fluid valve and a second fluid valve with said valves being fluid-flow connected together in series, said first fluid valve having fluid passageways selectively interconnectable with said second fluid valve for passing fluid to said second fluid valve in two directions of fluid flow, said second fluid valve and said two cylinders having four fluid-flow separated fluid-flow lines connected therebetween for directing the flow of fluid to and from said cylinders for extension and contraction of said cylinders for use in the loading and the dumping of the bucket, said two cylinders having head and rod ends and said four fluid-flow lines being respectively and separately and exclusively directly connected to said cylinder ends, and said second fluid valve having three combinations of four fluid passageways in each of said three combinations and being arranged to selectively and separately fluid-flow connect each of said three combinations with said four fluid-flow lines for both simultaneous and individual selective fluid pressurizing of said two cylinder ends.

4,037,744

LIFT TRUCK PUSHER DEVICE

Tony Nagin, Jr., and Tony Nagin, Sr., both of 2023 Lioncrest Drive, Richton Park, Ill. 60473

Filed May 10, 1976, Ser. No. 684,889
Int. Cl.[2] B60P *1/02*
U.S. Cl. 214—514 **15 Claims**



1. In a pusher device for lift trucks and the like, particularly for sheet-supported loads, the combination of a relatively fixed, generally vertically extending base structure provided with means for mounting the same on a lift truck, a platen structure rigidly carried by and extending generally horizontally outward from said base structure at the side thereof remote from the mounted side thereof, a pusher structure supported by said platen structure and movable thereon toward and away from said base structure, a plurality of pusher chains extending between said base and pusher structures with the adjacent ends of the chains secured to said base structure, which chains are each constructed to be rigid, when extended in substantially a straight line, to compression forces acting thereon along such line but capable of being flexed in a direction traverse to such line, a sprocket for each chain, rotatably supported by said pusher structure, by means of which said chains may be extended from or retracted to the latter, means carried by said pusher structure for guiding the free ends of the chains during retracting movement thereof whereby such free ends may be stored, in substantially a common plane, on said pusher structure, a power source carried by said pusher structure, and means operatively connecting said power source and said sprockets for rotating the latter in directions to simultaneously extend said chains or retract the same with respect to said pusher structure, and thereby correspondingly move the pusher structure toward or away from the base structure.

4,037,745

COMBINE GRAIN TANK UNLOADING MECHANISM

Edward John Hengen, Bettendorf, Iowa, and Eugene Byron Hutchinson, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

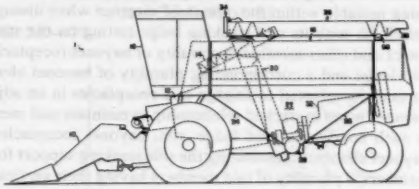
Filed Feb. 9, 1976, Ser. No. 656,321
Int. Cl.[2] B60P *1/40*
U.S. Cl. 214—521 **17 Claims**

1. In a combine harvester having a grain tank for temporarily holding processed grain and an unloading system for unloading grain from the harvester, the improvement in the unloading system comprising:

a generally upright auger conveyor operable to convey grain from the tank upwards and having an axis of rotation and an upper end;

an unloading auger conveyor having inner and outer ends and an axis of rotation and operable to receive grain from the upright conveyor at its inner end and discharge it from its outer end; and

mounting means carrying the unloading conveyor at the upper end of the upright conveyor, the mounting means including swivel means whereby the unloading conveyor may be positioned in a transport position and in a range of unloading positions, called an unloading zone, the swivel means having an axis of rotation, said axis being inclined to the axis of rotation of the upright conveyor so that the angle of the axis of rotation of the unloading conveyor



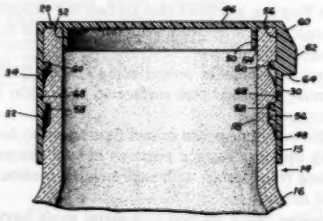
relative to that of the upright conveyor changes between the transport position and positions in the unloading zone, said mounting means further including a housing, connected to the inner end of the unloading auger conveyor in communication therewith, and an annular bearing means around the upper end of the upright auger conveyor pivotally mounting the housing on the upper end of the upright auger conveyor in communication therewith.

4,037,746

PLASTIC CAP AND BOTTLE NECK

Richard P. Ver Hage, North Haledon, N.J., assignor to GSF Corporation, Hawthorne, N.J.

Filed June 11, 1976, Ser. No. 695,266
Int. Cl.² B65D *41/46*
U.S. Cl. 215—31 **3 Claims**



3. A container, comprising:

a body portion;

a substantially cylindrical neck extending upwardly from the body to an upper edge said neck having a substantially cylindrical outer surface;

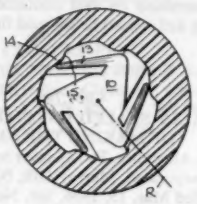
a pair of spaced circumferential grooves formed in said outer surface of the neck, the upper one of said grooves being spaced from the upper edge of the neck and the lower one of said grooves being spaced from the body portion so that the neck is divided into three separate cylindrical outer surface portions having increasing diameters from the upper most surface portion to the lower most surface portion, each of said grooves being partially defined by an annular surface intersecting the cylindrical outer surface portion farthest from the body portion at a right angle and a frustoconical surface intersecting the cylindrical outer surface portion closest to the body portion.

4,037,747

SAFETY CLOSURE CAP WITH TORQUE CONTROL

Daniel D. Acton, and John W. Boerstler, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 21, 1976, Ser. No. 688,594
Int. Cl.² B65D *55/02*
U.S. Cl. 215—219 **4 Claims**



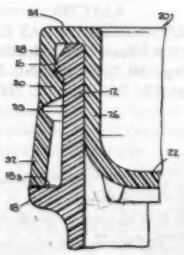
1. In a container sealing safety closure having an outer shell and an inner shell both with tops and depending skirts and having means for rotatively coupling said shells together in nesting relationships and with container engaging means on said inner shell and a plurality of elongated pawls extending outwardly from a central support on the top of one of said shells for operatively engaging ratchet teeth on the other of said shells when said closure is turned on to the container the improvement comprising said pawls and said ratchet teeth having their contacting surfaces shaped for sliding friction engagement to slide over each other at a predetermined closure torque application value.

4,037,748

CONTAINER AND CLOSURE

Edgar S. Stubbs, Jr., Guaynabo, P.R., assignor to Rigid-Pak Corporation, Bayamon, P.R.

Filed Feb. 5, 1976, Ser. No. 655,481
Int. Cl.² B65D *41/32*
U.S. Cl. 215—256 **9 Claims**



1. A container and closure therefor comprising:

a container having a base, a sidewall and open top, said sidewall having inner and outer surfaces,

a snap-on closure to cover said top and be retained on the container,

said closure having an inverted circumferential U-shaped rim adapted to fit over the rim of said sidewall, said rim of said closure having a circumferential inner leg and a circumferential outer leg spaced from said inner leg by approximately the thickness of said sidewall of said container,

said inner leg of said closure having an first interference fit relationship with said inner surface of said sidewall of said container,

an outwardly projecting circumferential first ridge on the

outer surface of said sidewall of said container and adjacent said open top of said sidewall,

said outer leg of said closure having a second interference fit relationship with said first ridge of said sidewall,

an inwardly projecting circumferential second ridge on the inner surface of said outer leg of said closure, said outer surface of said sidewall of said container having a third interference fit relationship with said second ridge,

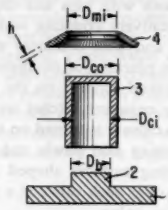
said second ridge snapping over said first ridge as said closure is assembled on said container, said second ridge underlying and spaced below said first ridge in the closed state.

4,037,749

HERMETICALLY SEALED ENVELOPE AND METHOD OF MAKING THE SAME

Kurt Reznicek, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 15, 1976, Ser. No. 666,878
Int. Cl.[2] H01L *23/10;* **H01J** *19/58*
U.S. Cl. 220—2.3 R **6 Claims**



1. A hermetically sealed envelope comprising:

a base having an elevated portion on the surface thereof;

a tubelike cover having one end portion fitted in the proximity of said elevated portion; and

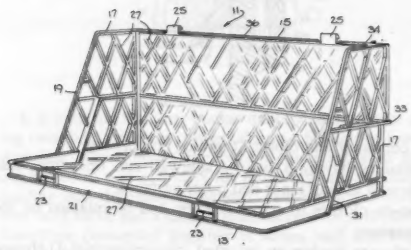
a separate sealing member positioned around said end portion and cold welded to said cover through permanent deformation thereby achieving a vacuum-tight seal between said base and said cover.

4,037,750

TRANSPORT-DISPLAY CASE

Theodor M. Box, 1108 Eileen Road, Brielle, N.J. 08730

Filed Apr. 10, 1975, Ser. No. 566,819
Int. Cl.[2] B65D *21/02, 11/10*
U.S. Cl. 220—4 E **3 Claims**



1. An integrally molded plastic transport-display crate adapted to hold a plurality of one dozen egg cartons for transport comprised of a pair of complementary separable similarly shaped upper and lower interlocking members ech having a generally rectangular base, an upstanding wall along a first edge thereof, a pair of opposed angular sidewalls adjoining said upstanding wall along respective second and third edges adjacent said first edge the enclosure defined by said sidewalls and said upstanding wall having an overhanging brow portion spaced from said base and defining a stacking ledge extending around the three walls of said enclosure parallel to said base, the outer extremity of said enclosure constituting a stacking rim parallel to said base complementary to said ledge and complementary releasable locking means on said member to hold them together in opposed juxtaposition to define a transport crate, said upper member removable to render said lower member a display rack for said egg cartons, either said member being nestable within the other said member when disengaged therefrom with its said stacking ledge resting on the stacking rim of said other member, a plurality of bayonet receptacles on said ledge and a corresponding plurality of bayonet elements on said rim adapted to engage said receptacles in an adjacent member when in stacked relationship to maintain said members in such conditions, said ledge, rim, bayonet receptacles and bayonet elements constituting the sole stacking support for said members, a plurality of said members having their vertical axes aligned, when nested relative to one another, with a vertical axis perpendicular to the bases thereof

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4,037,751

INSULATION SYSTEM

Robert C. Miller, Encino, Calif., and Harold E. Lemont, Arlington, Tex., assignors to Summa Corporation, Las Vegas, Nev.

Continuation-in-part of Ser. No. 352,218, April 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 272,468, July 17, 1972. This application Mar. 27, 1975, Ser. No. 562,765
Int. Cl.[2] E04B *1/62, 2/30, 2/34*
U.S. Cl. 220—9 R **35 Claims**

1. An all-metal, low-conductivity, high-performance and relatively low-weight composite structure for use as a thermal insulation, said structure comprising:

metallic member means forming one skin surface for exposure to a zone of one temperature;

means forming a second skin surface for exposure to a zone of another temperature which is different from said one temperature;

said metallic member means being spaced from said means forming a second skin surface so as to form a fluid space therebetween;

metallic means disposed in said fluid space to define a spacer with opposite surface portions of said spacer in adjacent facing relationship with said metallic member means and said means;

said spacer being formed of a metal mesh having deformations therein to increase the spacing between said metallic member means and said means forming a second skin surface;

fixing means maintaining said metallic member means, said means and said metallic spacer in fixed relationship to each other;

the wire mesh of said spacer defining relatively long paths for the conduction of heat between said metallic member means and said means forming a second skin surface;

said metallic spacer forming multiple void spaces between said metallic member means and said means forming a second skin surface and said void spaces being sufficiently small in size to limit the circulation of gas between said metallic member means and said means forming a second skin surface, and

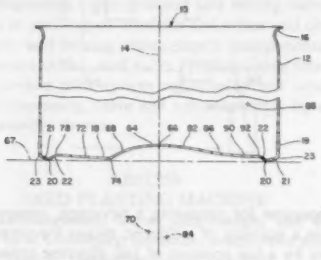
said composite structure being essentially free of non-metallic components.

4,037,752

CONTAINER WITH OUTWARDLY FLEXIBLE BOTTOM END WALL HAVING INTEGRAL SUPPORT MEANS AND METHOD AND APPARATUS FOR MANUFACTURING THEREOF

Joseph Francis Dulmaine, Wheatridge, and Michael Edward Bagrosky, Arvada, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Nov. 13, 1975, Ser. No. 631,539
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—70 **12 Claims**



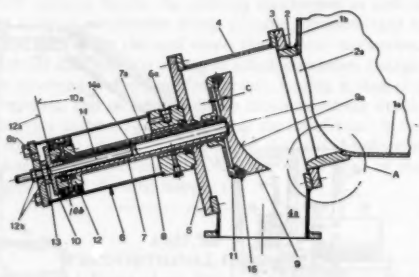
1. A generally cylindrical metal container having a product therein under pressure, said container including a generally cylindrical body having integral side and bottom walls, said bottom wall comprising a central inwardly extending area of depression, and a plurality of linearly extending surfaces located radially outwardly of and adjacent said area of depression, at least said linearly extending surfaces having been outwardly distended by pressure of said product to change the shape and configuration of the bottom wall such that said linearly extending surfaces become the outermost extent of the bottom wall and alone providing a stable base upon which the container rests in an upright position.

4,037,753

CONTAINER CLOSURE, ESPECIALLY FOR MIXING CONTAINERS

Justus Brandau, Körle-E., Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Germany

Filed Aug. 26, 1976, Ser. No. 717,902
Claims priority, application Germany, Sept. 1, 1975, 2538768
Int. Cl.[2] B65D *43/20, 55/00;* F16K *51/00*
U.S. Cl. 220—211 **4 Claims**



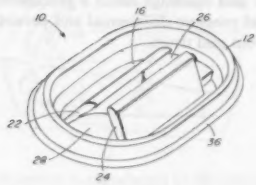
1. A closure for closing a container, which includes: a pressure medium operable cylinder piston system, comprising coaxially arranged first and second piston rod means, a substantially round closure dish connected to said first piston rod means and movable from an open position to a closing position for closing an opening of a container to be closed, a pressure dish having an annular end face and being connected to and movable by said second piston rod means toward and away from said closure dish, said closure dish having a peripheral step opposite said annular end face of said pressure dish, and an elastic sealing element arranged in said peripheral step for sealing engagement with the wall of an opening of a container to be closed when said closure dish is in its closing position, said annular end face of said pressure dish and said peripheral step of said closure dish when the said closure dish is in its closing position together defining a groove locating said sealing element.

4,037,754

CLOSURE PLUG

Julius B. Wilhelmi, Hull, Mass., and Roger E. Somers, Hudson, N.H., assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 6, 1976, Ser. No. 747,847
Int. Cl.[2] B65D *51/18, 51/00, 51/16*
U.S. Cl. 220—254 **11 Claims**



1. A closure plug for an opening in a closure that permits passage of a conduit therethrough for introducing a substance into the closure and that seals the opening against the escape of the substance upon withdrawal of the conduit, comprising:

an integral, resilient body member including

A. a peripheral portion for sealingly engaging the closure around the periphery of the opening;

B. a central portion extending inwardly from said peripheral portion and defining outer and inner major faces and an aperture communicating with the opening;

C. first and second flap portions extending above the outer face of said central portion from opposed sides of the aperture; and

D. first and second tab portions extending from said central portion between said flap portions toward the center of the aperture;

E. whereby said flap portions may be deformed past said tab portions through the aperture to allow the passage of the conduit therethrough and whereby, upon withdrawal of the conduit, said flap portions resiliently assume a relatively flat, overlapped position in contact with said tab portions to seal the aperture against escape of the substance therethrough.

4,037,755

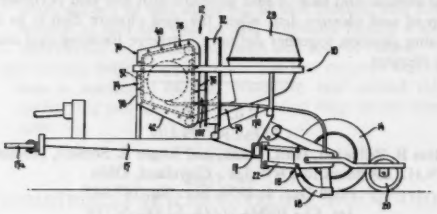
PNEUMATIC SEED DISPENSING APPARATUS

Floyd W. Reuter, Dearborn Heights, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jan. 29, 1976, Ser. No. 653,675
Int. Cl.[2] B65H *3/00;* A01C *7/08*
U.S. Cl. 221—211 **12 Claims**

1. A seed dispensing apparatus comprising: a housing, a drum supported in said housing for rotation about a horizontal axis, said drum and said housing forming a chamber therebetween, means to maintain said chamber at a higher pressure than the pressure in said drum, said drum having uniformly spaced openings disposed in the periphery of said drum and in a common plane disposed transversely to the axis of said drum, said openings communicating said chamber with the interior of said drum, means to convey seed to said chamber and to an upper circumferential surface exterior of said drum for depositing a seed in each of said openings, said seed being maintained in said openings by differential pressure in said chamber and in said drum, a rack assembly positioned in close proximity to the

exterior of said rotating drum at said circumferential surface, said rack assembly being operative to receive seed conveyed by said means conveying seed for distribution in said openings,



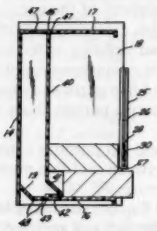
and discharge means positioned in said drum to close said openings when said openings reach a predetermined position to eliminate said pressure differential and permit said seeds to be separated from said drum.

4,037,756

DISPLAY-DISPENSER RACK

John Jaquish, New York, N.Y., assignor to Trans World Display Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 697,884
Int. Cl.[2] A47F *1/00*
U.S. Cl. 221—242 **9 Claims**



1. A display-dispenser rack for maintaining in exposed view for selective dispensing, a variety of differently sized articles, said rack comprising:

a compartment having a vertical rear wall, spaced vertical side walls, and a bottom wall;

a flange on at least one of the vertical side walls of said compartment extending in a vertical plane partially over the front of said compartment, leaving an opening at the front of said compartment exposing the contents of said compartment to view, said flange spaced from the bottom wall of said compartment a distance at least equal to the height of a single one of the largest articles to be held in and dispensed from said compartment; and

a vertically extending rear spacer member selectively positionable in said compartment at a spaced distance from the rear wall of said compartment to constrain the articles in said compartment toward said flange,

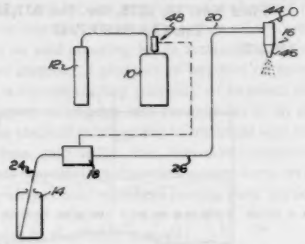
said rear spacer member comprising a vertically extending plate member; a spring leg resiliently joined to a lower end of said spacer and angled to extend down toward the front of said compartment to displace the lowermost article in the compartment to a dispensing position; and a toe joined to said leg, said toe engaging in an opening in the bottom wall of said compartment.

4,037,757

PREPARATION OF BEVERAGES

David William Green, Eastbourne, England, assignor to British Syphon Industries Limited, Sheffield, England

Filed Mar. 29, 1976, Ser. No. 671,287
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—129.2 **4 Claims**



1. Apparatus for preparing a beverage, comprising a container for a quantity of a diluent; means for pressurizing said container by a top pressure of gas; dispense apparatus; means for connecting said container to said dispense apparatus; a container for a concentrate of the beverage; a pump for feeding a measured quantity of said concentrate to the dispense apparatus; said pump having a reciprocable member disposed in a pumping chamber and carrying a non-return valve, a spring biasing said reciprocable member, said reciprocable member being displaced, under the influence of a coil carrying a one-half wave rectified alternating current, against the force of said spring, and non-return valves disposed on opposite sides of the pump for the respective supply of said concentrate from said container therefor and delivery of said concentrate to said dispense apparatus and means for opening said dispense apparatus to flow of diluent from the diluent container and for simultaneously driving the pump whereby the diluent and a measure of said concentrate are mixed together,

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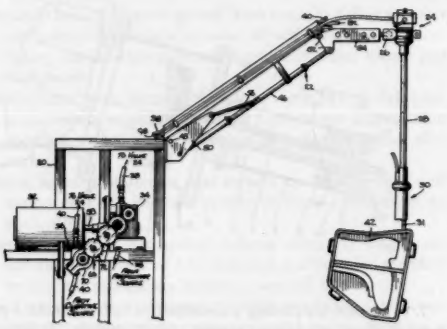
4,037,758

MOLD FILLING SYSTEM

Rene Bourque, Laval, Canada, assignor to Garcia Corporation, Teaneck, N.J.

Filed June 4, 1975, Ser. No. 583,568
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—134 **25 Claims**



1. Apparatus for filling molds with a reaction mixture, said apparatus comprising a supporting framework, an arm extending out from the supporting framework, a mixing device pivotally suspended from the outer end of said arm, reaction component conduits and bypass conduits extending from reaction component sources to said mixing device, said mixing device

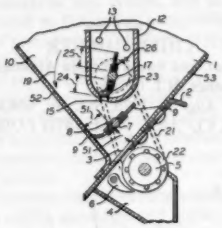
including mixing valve means having a reaction mixture outlet, a dispensing valve connected to said reaction mixture outlet, and a dispensing nozzle extending from said dispensing valve, said mixing valve means comprising a plurality of input ports connected to said reaction component conduits for receiving various reaction mixture components, a corresponding plurality of bypass ports connected to said bypass conduits for discharging individual reaction mixture components, said valve means being operable to switch reaction mixture flow from said conduits alternately through said reaction mixture outlet or to said separate bypass conduits; and means synchronizing said mixing valve means with said dispensing valve whereby when said dispensing valve is closed said mixing valve directs components to said bypass conduits and when said dispensing valve is open said mixing valve directs components to said reaction mixture outlet, said valve synchronizing means comprising a common pilot system constructed and arranged to operate said dispensing valve and valve assembly by applying pilot fluid pressure thereto.

4,037,759

SEED PLANTING MACHINE

Franz Grosse-Scharmann; Bernd Gattermann, and Bernhard Steenken, all of Oldenburg, Germany, assignors to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Germany

Filed Dec. 22, 1975, Ser. No. 643,049
Claims priority, application Germany, Dec. 21, 1974, 2460869
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—142 **24 Claims**



1. Planting machine having a seed planting mechanism and a seed hopper, and serving for the disinfecting of the seed, which is provided in its lower region with outlet openings for the disinfected seed and with a driven agitator mechanism disposed above said outlet openings, which comprises an agitator shaft with agitator means, the planting mechanism as well as also the agitator mechanism being drivable, characterized in that in the hopper for the seed above the agitator mechanism, a disinfectant distributor is arranged which comprises a magazine for receiving a supply of disinfectant, having at least one outlet opening, and of feeding means movable during operation relatively to the magazine to supply the disinfectant to the outlet opening(s) of said magazine and that the disinfectant distributor extends substantially over the entire area of the outlet openings of the seed hopper **(1).**

4,037,760

PROPORTIONAL DILUTER

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

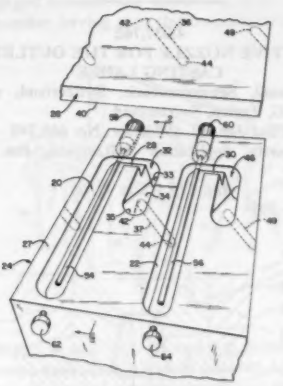
Filed Apr. 23, 1976, Ser. No. 679,564
Int. Cl.[2] B67D *5/60*; G01F *11/26*
U.S. Cl. 222—145 **14 Claims**

1. A device for proportional liquid dilution, said device comprising in combination:

a structure including at least two storage chambers and at least one sampling chamber having a fixed volume smaller than either of said storage chambers and communicating between said storage chambers to provide a permanently open path for liquid flow therebetween; and

means for cyclically operating said device;

said chambers being so fixedly disposed with respect to one another that during each cycle, liquid in a first of said



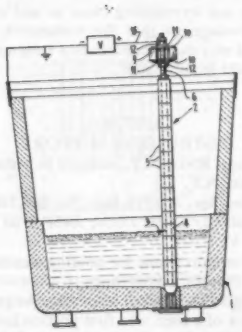
storage chambers is transferred to fill said sampling chamber and then substantially all liquid in said sampling chamber is transferred to the other of said storage chambers, said transfer between said chambers occurring only in a direction from said first to said other storage chamber.

4,037,761

INDICATION OF LEVELS IN RECEPTACLES

Kenneth Garry Kemlo, Lambton, and Clive Allen Gregory, Armidale, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Australia

Filed May 13, 1975, Ser. No. 577,011
Claims priority, application Australia, May 13, 1974, 7532/74
Int. Cl.[2] B22D *37/00*
U.S. Cl. 222—590 **11 Claims**



11. A method of locating the interface between molten metal having a first electrical property and a slag layer having a second electrical property which are separate phases of a melt held in a ladle said method being employed when the melt is being emptied from the ladle and comprising the steps of positioning a single electrode at a predetermined level within the ladle and in contact with the material in the ladle at that predetermined level, by employing the molten metal being teemed detecting the first electrical property associated with said molten metal through said electrode positioned at the predetermined level while said electrode is in contact with the molten metal phase of the melt, monitoring the detected first electrical

property while teeming and thereafter by employing the molten metal being dispensed determining when the slag phase is at the predetermined level by detecting the second electrical property associated with said slag through said electrode positioned at the predetermined level when the slag phase of the melt contacts said electrode.

4,037,762

PROTECTIVE NOZZLE FOR THE OUTLET OF A CASTING LADLE

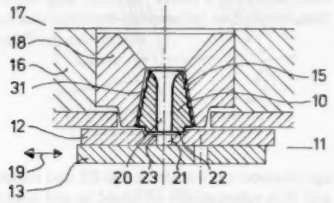
Franz Ruckstuhl, Schwerzenbach, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed Jan. 13, 1976, Ser. No. 648,740

Claims priority, application Switzerland, Jan. 23, 1975, 818/75

Int. Cl.[2] **B22D** *41/08*

U.S. Cl. 222—591 **8 Claims**



1. A protective insert for the outlet passage of a container for molten material, said outlet passage being in the form of a conical bore, said protective insert comprising a body having an axial passage and a truncated cone-shaped exterior surface having a cone axis, said conical bore of said outlet passage having an interior surface which, when said insert is disposed in said outlet passage, defines with said exterior surface of said protective insert an annular gap, said exterior surface having a plurality of elevations projecting therefrom with said elevations lying substantially along a virtual conical boundary surface coaxial with said cone axis of said exterior surface and extending in a direction inclined with respect to a plane containing said cone axis, said elevations substantially bridging said annular gap and terminating close to said interior surface of said outlet passage so that the volumetric displacement occupied by said elevations comprises a substantial portion of the volume of said annular gap.

4,037,763

INSTRUMENT SUPPORT

Dick Turchen, Pearl River, N.Y., assignor to Video Components, Inc., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,748

Int. Cl.[2] **G03B** *17/00;* **A45F** *3/08*

U.S. Cl. 224—5 V **11 Claims**

1. A portable support frame for holding a camera and equipment accessory thereto, comprising:

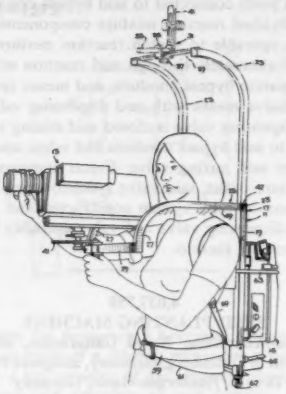
a frame having a first portion adapted to be positioned adjacent the back of a user, said first portion having a vertical length extending from the hip region of the user up to a level above the shoulders of the user, and a second portion having a pair of arms adaptable to extend forwardly from the upper end of said first frame portion at opposite sides, respectively, of the user's head above the level of the user's shoulders,

a cross-bar connecting the pair of arms;

means for hingedly connecting the rear portions of said arms to the upper end of said first frame portion for pivotal movement of said arms in only a vertical plane between a first position in which said arms are generally horizontal and a second position in which said arms are generally vertical;

pod means attached to the cross-bar in the region in front of the user for supporting a camera, where said camera is cantilevered from said first frame portion;

a belt adapted to wrap around the hip region of the user for supportion substantially all of the weight of the camera and its accessory equipment on the hip of the user; and



means on said first frame portion for attachment thereto of the accessory equipment in a position adjacent the back of the user.

4,037,764

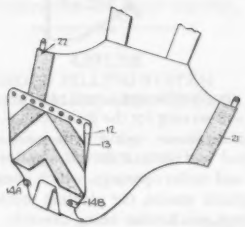
CHILD CARRIER

Emanuel Almosnino, and Susan Draisin Almosnino, both of 186 Ives St., Providence, R.I. 02906

Filed Aug. 28, 1975, Ser. No. 608,691

Int. Cl.[2] **A63G** *9/00;* **A47D** *13/02*

U.S. Cl. 224—6 **7 Claims**



1. A child carrier which may be mounted on the back or front of a bearer, said carrier comprising a flat piece of flexible material contoured to define a back section having a pair of outstretched wings and joined by a Venturi-shaped crotch section to a flap section, the width of the back section with outstretched wings exceeding that of the flap section, the carrier being assembled by placing a child therein with its back resting on the back section, after which the flap is folded over the child's abdomen with the child's legs extending through openings formed by the crotch section, to create a diaper-like pouch, the pouch being completed by overlapping and fastening the wings on the folded-over flap section, said wings being detachably connected to the exposed surface of said folded-over flap section by fabric fasteners formed by male elements secured to the margins of the wings and female elements secured to and extending across the exposed surface of the flap section whereby the size of the pouch may be conformed to the body of the child, a pair of straps attached to the back section and loopable over the shoulders of the bearer, and snap fastener means to latch said wings onto said flap section, said snap

fastener means being constituted by female snap elements mounted on the free ends of tabs attached to the corners of said wings and complementary male snap elements mounted in a row across the flap section, whereby said wings may be latched at any selected position across said flap section to prevent the male elements of the fabric fasteners from peeling off.

4,037,765

GOLF CLUB CARRIER

Mitchell Slayman, 30701 Fairgreens West, Laguna Niguel, Calif. 92677

Filed Aug. 25, 1976, Ser. No. 717,582
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—25 R **3 Claims**

1. A golf club support system adaptable for resting upon the shoulders of a golfer, wherein the weight of the golf clubs is distributed throughout said system, and said system is pivotable freely relative to the golfer, comprising:

a plurality of semi-circular platform supports, which rest on the shoulders of the golfer,

a plurality of swivels, each of which is pivotally attached to each said semi-circular support, whereby each said support will pivot freely in a vertical and horizontal direction,

a plurality of horizontal members substantially parallel to the golfer's shoulders, each said horizontal member secured to each said swivel,

a plurality of lateral members substantially perpendicular to the width of the shoulders and angled outward from the golfer's chest, each said lateral member substantially perpendicular to each said horizontal member,

a plurality of vertical members projecting outward from the chest that terminate in a substantially v-shaped collar to enable the golfer to balance said support system, each said vertical member substantially perpendicular to each said lateral member,

a plurality of legs parallel on either side of the golfer's body, and substantially parallel to each other, each said leg perpendicular to each said horizontal member, and

a golf club carrying means releasably secured to each said leg whereby golf clubs can be transported by said system when said means is secured to each said leg and said platform supports rest on the shoulders of the golfer.

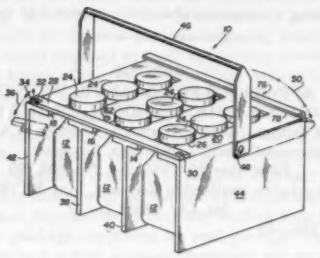
4,037,766

MULTIPLE BOTTLE CARRIER

John Q. Iacono, 1638 Jasmine Ave., New Hyde Park, N.Y. 11040

Filed Mar. 3, 1976, Ser. No. 663,301
Int. Cl.[2] B65D 71/00
U.S. Cl. 224—45 AA **6 Claims**

1. A multiple bottle carrier comprising a top bottleneck-gripping member of generally rectangular shape having plural slots of a selected width therein each open at one end and oriented transversely of said member in spaced apart relation to accommodate bottles each having an operative position in said carrier in which the neck of a bottle is projected upwardly through one said slot and a larger diameter cap is engaged to the bottleneck to obviate reverse direction movement through said slot, a closure element for said slots oriented transversely of said top member adjacent said slot end openings and arranged for opening and closing movements relative to said slot end openings, an upstanding grip along said top member remote from said slot end openings in overhanging relation to said top member, a slot size-adjusting member having an operative superposed relationship with said top member with an edge thereof engaged beneath said upstanding grip, said slot size-adjusting member having slots therein each open at the same



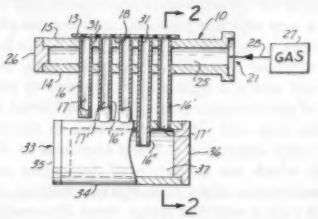
one end thereof as said slots of said top member to receive bottles through said open ends and adapted to assume a selected degree of misalignment relative to said slots of said top member so as to diminish the effective width of said slots of said top member to the extent of said degree of misalignment, whereby said slots of said carrier are adapted to be used for a range of sizes of bottles, and means depending from said top member to support bottles held in the carrier free of contact with a support surface.

4,037,767

TAPE TRANSPORTING APPARATUS

Herbert Karsh, Laguna Beach, and Edgar S. Gilchrist, Newport Beach, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 17, 1975, Ser. No. 632,322
Int. Cl.[2] B65H 17/32
U.S. Cl. 226—7 **29 Claims**



1. In apparatus for transporting a tape, an improvement for suppressing a predetermined flutter component, comprising in combination:

first means for defining a surface for guiding said tape;

second means extending to said tape guiding surface and defining a gas column having a resonance frequency corresponding to the frequency of said flutter component; and

third means operatively associated with said first means for coupling said gas column to said tape, including means for establishing and maintaining at said gas column a gas film of a controlled thickness between said guiding surface and said tape;

said third means including at least one first aperture in said guiding surface and means connected to said first aperture for issuing pressurized gas at a controlled rate through

said first aperture and toward said tape to provide said controlled thickness gas film;

said first means having a second aperture in said guiding surface, said second aperture being distinct from said first aperture; and

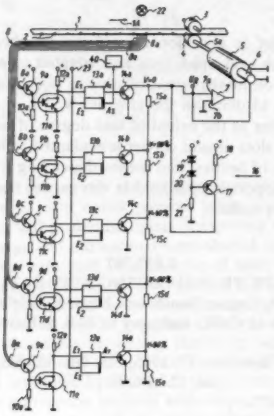
said second means extending through said distinct second aperture to said guiding surface, including a tube communicating through said distinct second aperture with said gas film and forming said gas column including means defining a resonance chamber connected to said tube.

4,037,768

APPARATUS FOR BRAKING WEBS OF PHOTOGRAPHIC MATERIAL OR THE LIKE

Eberhard Escales, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 20, 1976, Ser. No. 688,190
Claims priority, application Germany, May 30, 1975, 2524101
Int. Cl.[2] B65H *25/10*
U.S. Cl. 226—43 **13 Claims**



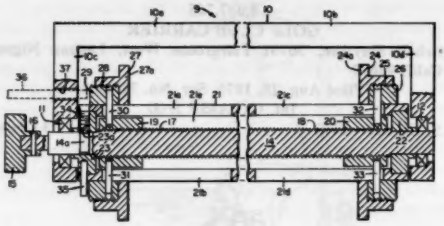
1. Apparatus for repeated rapid acceleration and controlled braking of a web which is provided with a series of markers, such as notches, or perforations, comprising means for moving the web lengthwise along a predetermined path, including a variable-speed motor; a light source adjacent to said path; a succession of photosensitive transducers positioned to receive light seriatim from said source in response to movement of a marker past said source and to effect transmission of different first signals which are indicative of decreasing permissible speeds of said motor while such marker occupies those portions of said path in which it brings about illumination of successive transducers, said transducers including a first transducer and a last transducer; means for changing the speed of said motor in response to said first signals, including means for furnishing a second signal which is indicative of the actual speed of said motor and means for comparing said second signal with first signals whose transmission is effected by successive transducers and for changing the speed of said motor in response to transmission of successive first signals thereto so that the speed of said motor decreases from the speed indicated by said second signal to the speed indicated by a first signal not later than when the nextfollowing transducer of said succession effects the transmission of a first signal, the first signal whose transmission is effected by said last transducer being indicative of zero speed; and a chain of series-connected resistors in circuit with said transducers, one for each of said transducers said chain having a terminal for transmission of first signals to said signal comparing means.

4,037,769

GUIDE ROLLER ASSEMBLY

Wheeler W. Meyers, Savona, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,990
Int. Cl.[2] B65H *23/02*
U.S. Cl. 226—190 **2 Claims**



1. A guide roller assemmbly adjustable to guide, at different times, lengths of tape, ribbon or similar material of different widths so that the centerline of the width of each of said lengths may be made to coincide with a centerline extending about the periphery of the roller of said assembly midway between the ends thereof and during longitudinal movement of each said length over said periphery of the roller, such guide roller assembly comprising;

A. a longitudinal hollow roller embodying slots extending from near each end of the roller to near the center thereof and having extending through the length of said hollow a shaft for rotationally supporting said roller, the ends of said shaft extending into rotational bearings disposed in a support member therefor and such shaft having threads of opposite hands extending from near first and second ones of said ends of the shaft to near the center thereof;

B. first and second internally threaded sleeve member screwed corresponding distances onto said threads on said first and second ends, respectively, of said shaft, such sleeve members being longitudinally movable within the hollow of said roller;

C. first and second flanged wheels correspondingly snugly disposed on the outer periphery of said roller between the center and first and second ones of said ends, respectively, of the roller and slidably movable along the length thereof;

D. means extending snugly through said slots in said roller and slidably movable along the length of such slots, such means also extending snugly into associated ones of said wheels and said sleeves for rotation thereof correspondingly with said roller;

E. manually releasable keying means for normally keying said shaft with said roller for rotation thereof in unison; and

F. means for imparting rotation only to such shaft when said keying means are manually released and said wheels and roller are held against rotation thereof.

4,037,770

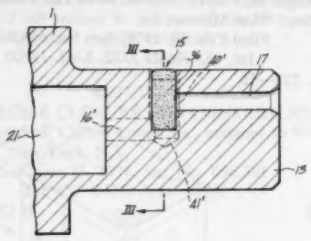
TOOL USING CASELESS AMMUNITION

Roger Dorgnon, St. Peray; Marc Combette, Valence; Jean Luthringer, Paris, and Jean Ollivier, Valence, all of France, assignors to Olin Corporation, New Haven, Conn.

Filed June 11, 1976, Ser. No. 695,287
Claims priority, application France, June 27, 1975, 75.20311
Int. Cl.[2] B25C *1/14*
U.S. Cl. 227—9 **3 Claims**

1. A power-actuated tool of the type utilizing caseless ammunition pellets contained in a recess in a cylindrical breech, said recess for the ammunition comprising two blind bores each of whose diameter is greater than the thickness of the ammunition pellet and whose depth is similar to or greater than the diameter of the ammunition pellet, said blind bores being

connected by a slot having a depth which is at least equal to the diameter of the ammunition pellet and further comprising at



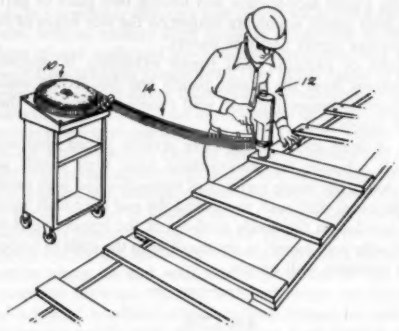
least one combustion gas duct opening into the bottom of at least one of the blind bores.

4,037,771

FASTENER DRIVING APPARATUS UTILIZING HIGH CAPACITY FASTENER PACKAGE

William J. Peterson, Coventry, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 1, 1976, Ser. No. 662,954
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—130 **31 Claims**



1. Apparatus for driving successive fasteners from a package of generally parallel fasteners flexibly serially interconnected in general row formation having a total virgin package weight greatly in excess of that which could be practically manually handled, said apparatus comprising:

a portable power operated fastener driving device comprising a housing including a handle operable to be grasped by an operator to enable the operator to manually handle the device within a workpiece containing limited space, means carried by said housing defining a fastener drive track, means carried by said housing for engaging a leading portion of a fastener package and feeding successive leading fasteners laterally into said drive track, and power operated means carried by said housing for driving successive leading fasteners fed to said drive track longitudinally outwardly thereof into a workpiece contained in said limited space,

means for supporting a package of fasteners as aforesaid at a location spaced horizontally from the limited space within which the device is to be manually handled,

movable elongated bridge means of a horizontal extent sufficient to extend from the location of said package supporting means to the limited space within which the device is to be manually handled,

said movable bridge means having fastener package engaging means for receiving at one end of said bridge means a leading length of serially interconnected fasteners in row formation from the package supported by said package supporting means and for supporting the same for movement in the direction of extent of the row formation along the longitudinal extent of said elongated bridge means from said one end thereof outwardly of the other end thereof,

means connecting the other end of said movable bridge means in supported relation with respect to said device housing for movement thereof in response to the manual handling movement of the device within said limited space with the fastener package engaging means of said bridge means disposed to guide the leading portion of the leading length of the fastening package outwardly of said other end and into cooperating relation with the fastener feeding means of said device, and

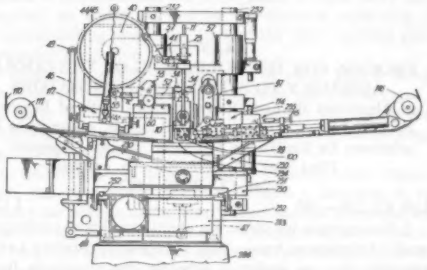
means for supporting said one end of said movable bridge means for movement in a horizontal direction while maintaining the same in cooperating relation with said package supporting means with the one end of said package engaging means disposed to receive the leading length of the fastener package supported by said package supporting means in such a way as to accommodate any movements imparted to the other end of said movable bridge means by the manual handling movements of said device whereby such manual handling movements can be accomplished by the operator while supporting only a proportionate share of the weight of the bridge means and leading length of the fastener package supported thereon.

4,037,772

APPARATUS FOR BONDING WIRE LEADS

Jean Marcel Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 4, 1976, Ser. No. 729,197
Int. Cl.[2] B23K *21/02*; H01L *21/601*
U.S. Cl. 228—1 R **26 Claims**



1. Apparatus for bonding wire leads to contacts on a device, comprising:

a bonding tool, said tool including an arcuate bonding surface for contact with said leads at a bonding position;

a support member having a forward end and a rearward end, said bonding tool attached at said forward end;

means supporting said support member, at said rear end, on a main support structure, said means comprising at two axis pivotal structure;

said two axis pivotal structure including a pivot for reciprocal rotation of said support member about a first axis extending from said main support structure and tangential to said arcuate bonding surface, said pivot mounted on a pivot support member mounted for reciprocal movement about a second axis normal to said first axis and tangential to said arcuate bonding surface, said first and second axes intersecting on said arcuate bonding surface at a bonding portion thereon;

means for reciprocating said pivot and said pivot support member about said first and second axes respectively, in a

predetermined cycle whereby said bonding position moves over said arcuate bonding surface on a predetermined path.

4,037,773

BONDING OF METALS TO SOLID ELECTROLYTES

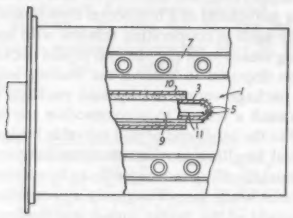
Robert George Hamilton Record, Luton, England, assignor to George Kent Limited, Luton, England

Filed Dec. 5, 1975, Ser. No. 638,090

Claims priority, application United Kingdom, Dec. 9, 1974, 53229/74

Int. Cl.[2] B44D *1/50*

U.S. Cl. 228—122 12 Claims



1. A method of bonding a metal to a solid electrolyte material, suitably for making an electrolytic cell for measuring the oxygen content of gases, comprising:

applying a layer of the metal to a surface of the material; and then

heating the material in an atmosphere consisting or consisting substantially of hydrogen at a temperature and for a time sufficient to effect bonding of the metal to the material.

4,037,774

PROCESS FOR THE SOLDERING OF THE COOLER ASSEMBLY TO AUTOMOBILE RADIATORS

Dan Alexandru Barozzi; Valentin Calin, both of Brasov, and Zsigmond Peter, Prejmer, all of Romania, assignors to Intreprinderea De Radiatoare Si Cabluri, Brasov, Romania

Filed Sept. 12, 1975, Ser. No. 612,804

Int. Cl.[2] B23K *1/02*

U.S. Cl. 228—183 2 Claims

1. In a process for soldering aluminum fins to cooling pipes made of aluminum, brass, steel, or copper to produce a cooling assembly for car radiators wherein the aluminum fins are etched and provided with a protective coating, wherein the cooling pipes are coated with solder, and where the aluminum fins are then mounted upon and soldered to the cooling pipes in a thermal bath, the improvement wherein:

a. the aluminum fins are etched for a period of 15 to 30 seconds at a temperature of 32° to 60° C in a solution which consists essentially of 10 to 14% sodium hydroxide, 4 to 7% zinc cyanide, 20 to 30% technical urea with the balance water; to prevent subsequent electrocorosion thereon;

b. the aluminum fins are then rinsed with running water for one minute;

c. the protective coating has a thickness of 2 to 4 microns and is applied by immersing the fins after etching in a bath which consists essentially of 10 to 30% technical stearine with 80 to 90% ethylene trichloride for 30 to 60 seconds at a temperature of 30° to 40° C; and

d. the thermal bath used during soldering consists essentially of 98% mineral oil having the following physical constants: minimum flash point 315° C and viscosity at 100° C of 45 to 65 c St and 2% technical stearine.

4,037,775

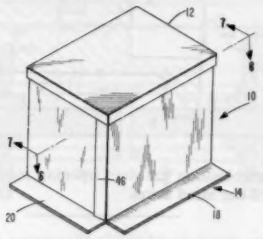
BULK REINFORCED LAMINATED CONTAINER

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Feb. 18, 1976, Ser. No. 658,967

Int. Cl.[2] B65D *5/72, 5/48, 13/00*

U.S. Cl. 229—15 6 Claims



1. A bulk reinforced laminated container body comprising

an outer shell having four serially joined shell wall panels and a joint flap hinged on one end of the shell wall panels and secured to the shell wall panel at the other end of the shell wall panels,

a center reinforcing partition having two center partition panels joined face-to-face and having two pairs of partition wall panels which are hinged on the side edges of the respective center partition panels,

said pairs of partition wall panels extending in opposite directions from the center panels and bonded to inside surfaces of respective side wall panels of the outer shell wall panels and

a pair of liners each having three serially joined liner wall panels wherein the intermediate liner wall panels are bonded to the inside surfaces of respective end wall panels of the outer shell wall panels and the end liner wall panels are bonded to the inside surfaces of the respective outer shell side wall panels in abutment with the ends of respective partition wall panels.

4,037,776

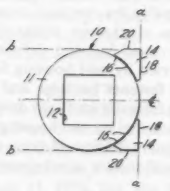
CIRCULAR LID

George Leroy Meyers, Menasha, and Thomas Dominic Pawlowski, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 26, 1976, Ser. No. 680,463

Int. Cl.[2] B65D *5/64, 43/00*

U.S. Cl. 229—43 10 Claims



1. A unit blank for producing a single circular lid, comprising a circular main portion, and tab means projecting from the circumference thereof, said circular portion and said tab means being integrally formed from a piece of lid stock and having weak interconnecting means therebetween for facile detachment of said tab means, said tab means being configured to provide at least two rectilinear trailing edge portions on said blank outwardly of said circular portion, said edge portions

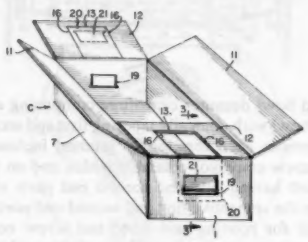
being aligned on a common axis extending perpendicularly to a medial axis, which medial axis is aligned with a diameter of said circular portion of said blank, whereby engagement members of a machine may contact said blank on said trailing edge portions of said tab means, to push said blank through the machine with a constant angular orientation.

4,037,777

HANDHOLE CLOSURE FOR CONTAINERS

William G. Maughan, Clifton Forge, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed June 15, 1976, Ser. No. 696,381
Int. Cl.[2] B65D *5/46, 25/22*
U.S. Cl. 229—52 B **1 Claim**



1. In a container having a pair of end walls and a pair of side walls, bottom closure flaps foldably connected to the lower edges of said walls and top closure flaps comprising a pair of major flaps foldably connected to the upper edges of said side walls and a pair of minor flaps foldably connected to the upper edges of said end walls, the improvement comprising handhole cutouts in each of said end walls with integral means for reinforcing said handhole cutouts and for shielding the entry of light and contamination into said container through said handhole cutouts, said integral means comprising a pair of reinforcing panels formed in said minor top closure flaps each of said reinforcing panels having an outer edge and two side edges wholly cut from a minor top closure flap and a foldable connection along an end wall that is common to the foldable connection between said end wall and minor top closure flap and a pair of handhole shielding flaps formed in each of said reinforcing panels, said shielding flaps each having an outer edge and two side edges wholly cut from a reinforcing panel and a foldable connection with said reinforcing panel that is parallel to and offset from the foldable connection between each reinforcing panel and end wall, wherein said reinforcing panels are adapted to be folded inside said container to lie adjacent the respective end walls and said handhole shielding panels are adapted to be engaged within the handhole cutouts in the perspective end walls.

4,037,778

UNIVERSAL BAG SUPPORT

Kenneth E. Boyle, 9126 Hayes, Overland Park, Kans. 66212

Continuation of Ser. No. 553,250, Feb. 26, 1975, abandoned.
This application Sept. 7, 1976, Ser. No. 720,579
Int. Cl.[2] B65D *33/02;* **B65B** *67/12*
U.S. Cl. 229—55 **1 Claim**

1. A free-standing refuse receptacle comprising:

a normally upright, flexible bag having a closed bottom adapted for resting on a supporting surface, an open top, and a continuous, annular sidewall extending between said top and bottom to define an interior refuse-receiving space,

said sidewall being flaccid throughout its expanse so as to render the bag incapable of supporting itself on said surface in an open and upright condition; and

an erect, substantially tubular and horizontally polygonal device within said bag holding the latter in said normally open and upright condition,

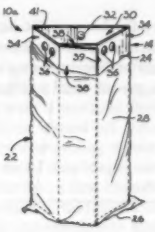
said device comprising a sheet of material having a pair of opposite, normally vertical end edges, a pair of opposite, normally horizontal upper and lower edges extending continuously between said end edges, and a pair of oppositely facing, normally inner and outer surfaces bounded by said edges,

said sheet being received within said space with said lower edge engaging the bottom of the bag and being substantially devoid of inherent resiliency but sufficiently rigid to avoid buckling,

said sheet having four vertically extending hinge lines formed therein, each extending continuously from the upper edge of the sheet to the lower edge thereof,

a central paid of said hinge lines defining a central upright panel of said sheet therebetween that has a width defined by the distance separating said central pair of lines,

an outer pair of said hinge lines being located on opposite sides of said central pair so that a pair of outer upright panels are presented on each side of said central panel,



one panel of each outer pair having its width defined by the distance separating the two hinge lines between which the panel is disposed, and the other panel of each outer pair having its width defined by the distance separating a corresponding said outer edge of the sheet and the next adjacent hinge line,

the combined widths of each pair of outer panels being substantially the same as said width of the central panel,

said outer surface of the sheet frictionally supporting the sidewall of the bag and said end edges of the sheet being mutually detached,

all of said hinge lines being operable to permit their respective panels to swing inwardly in such a direction as to move the portion of the sheet's inner surface presented by the moving panel toward that of the enext adjacent panel,

said hinge lines being further operable to permit the panels to be swung inwardly to such an extent as to render the device folded into a compact condition in which the two pairs of outer panels are alternately superimposed on said central panel and in which the final dimensions of the compacted device are substantially defined by said width of the central panel and the distance between said upper and lower edges of the sheet.

4,037,779

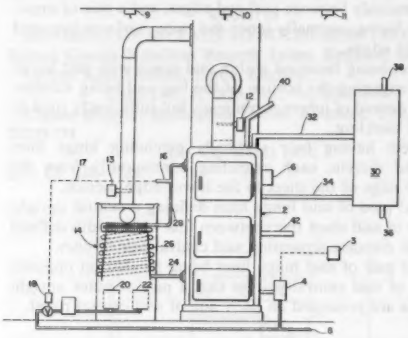
HEATING SYSTEM HAVING HIGH-LOW TEMPERATURE LIMIT CONTROLLED AUXILIARY BOILER

Joseph Jean Roy, 9811 Rosaryville Road, Upper Marlboro, Md. 20870, and Lorenzo Roy, 81 Hawley St., Lawrence, Mass. 01843

Filed Jan. 30, 1976, Ser. No. 653,780
Int. Cl.[2] F24D *3/02*
U.S. Cl. 237—8 R **6 Claims**

1. In a hot fluid conductor heating system having main boiler means with a given fluid capacity, main heating means having a given thermal capacity for heating the main boiler and thermostat means for actuating the main heating means, the im-

provement comprising: auxiliary boiler means having a fluid capacity less than said given capacity, said auxiliary boiler means connected to said main boiler means, auxiliary heating means having a thermal capacity substantially less than said



given thermal capacity for heating the auxiliary boiler means and high-low temperature control means connected to said auxiliary heating means and maintaining a given temperature range of fluid conductor in said auxiliary and main boiler means.

4,037,780

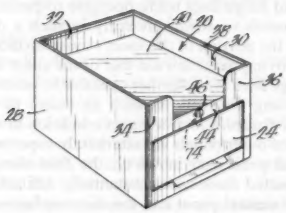
LOCKING LETTER TRAY

Sherwood S. Brownlee, Waynesboro; Fred H. Grubb, Stuarts Draft, and Richard C. Smith, Charlottesville, all of Va., assignors to Acme Visible Records, Inc., Crozet, Va.

Filed Apr. 5, 1976, Ser. No. 673,638

Int. Cl.[2] E05B *65/46*; B65D *55/14*

U.S. Cl. 232—31 **7 Claims**



1. In a desk top type locking letter tray for containing correspondence and the like, a housing having a base wall, a top wall spaced therefrom and parallel thereto, and side walls extending between the edges of said base and top walls forming a closure therewith, one of said side walls having an elongated slot formed therethrough toward said top wall for movement therethrough of correspondence into said closure, and another of said side walls having an enlarged opening therethrough and a lockable door associated therewith, said side walls extending beyond said top walls and defining therebetween and with said top wall an open tray for containing correspondence, said door when locked blocking entry to said closure through said opening and when unlocked being movable to clear said opening for removal of correspondence from said closure through said opening.

4,037,781

DECANTER CENTRIFUGE APPARATUS

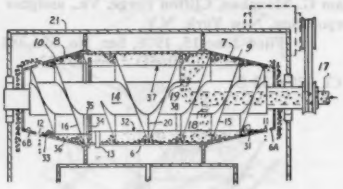
Robert Edward High, St. Ives, Australia, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 1, 1976, Ser. No. 672,698

Claims priority, application Australia, Apr. 1, 1975, 1058/75; Nov. 24, 1975, 4062/75

Int. Cl.[2] B04B *1/20*

U.S. Cl. 233—7 **5 Claims**



1. A solid bowl decanter centrifuge comprising a rotatable cylindrical bowl with conically tapering first and second opposite end portions each forming an internal inclined annular surface, a screw conveyor rotatable within and on the axis of the bowl and having first and second end parts of opposite pitch within the respective first and second end portions of the bowl, means for rotating said bowl and screw conveyor at different speeds, means for depositing a sludge within the bowl for separation of its different phases, means for discharging heavy and light solids phases of said sludge at the respective first and second end portions of the bowl, means for draining a liquid phase from the bowl between said end portions, said first and second opposite end portions of said bowl having respective first and second weirs to retain in the bowl during operation an annular pool of sludge, a heavy solids phase of the sludge being lifted from said pool and discharged over the first weir at said first end portion by the first end part of said screw conveyor, said means for draining the liquid phase of said sludge being a tube fixed to and passing through said bowl and having an inner orifice as an entry for said liquid phase, said orifice being spaced radially from the rotational axis of said bowl a greater distance than said first weir, a light solids phase of the sludge being discharged over the second weir at said second end portion, the second weir having a radial spacing from the rotational axis of said bowl which is intermediate that of said first weir and that of said liquid phase orifice, a primary radial baffle having its outer periphery spaced from the inner wall of said bowl to provide a passage, said primary baffle being secured to the screw conveyor at a position between said second weir and said liquid phase tube, said second weir having a radial spacing from the rotational axis of said bowl which is greater than that of said liquid phase orifice, whereby the light solids phase is discharged over the second weir by combined action of said screw flights and the hydraulic pressure of said liquid phase communicated via said passage, and an auxiliary radial baffle secured to said screw conveyor which is located between said liquid phase tube and the first weir, whereby in operation a light liquid phase of the sludge is confined between the primary and auxiliary baffles and is discharged via the liquid phase tube while a heavy liquid phase is discharged via said passage and over the second weir.

4,037,782

ENGINE CONDITION CALCULATING DEVICE

William Nelson Jackson, St. Louis, Mo., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 12, 1976, Ser. No. 704,712

Int. Cl.[2] G06G *1/02*; G06C *3/00*

U.S. Cl. 235—84 **7 Claims**

1. A calculating device for monitoring a turbine engine's

condition on a daily basis from engine performance parameters N_1, EGT and OAT,

wherein N_1 measures the revolutions per minute of the gas producer section of the engine and is expressed in percent rpm,

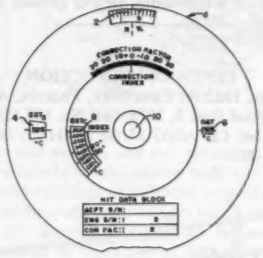
wherein EGT is engine gas temperature,

and wherein OAT is outside air temperature, the calculating device comprising

a base having

an OAT scale increasing linearly in a predetermined direction and calibrated in degrees Celsius,

an N_1 scale increasing linearly in the same predetermined direction and also calibrated in degrees Celsius, first and second EGT scales in parallel disposition in increasing units, the OAT, N_1 and EGT values being oriented with respect to each other so that for each value of OAT



corresponding values of N_1 and EGT are equally spaced on said base plate,

a first overlay plate adapted to overlie the base plate the first overlay having windows over the OAT, N_1 and the first EGT scales, oriented to expose an EGT value on the EGT scale and corresponding values of N_1 and OAT on the other two scales when the plate is moved from one value to another, and having a correction factor scale of numerals imprinted thereon,

and a second overlay plate adapted to overlie the first overlay plate

the second overlay having a window which exposes EGT values on the second EGT scale,

and an indexing line adapted to lie opposite numerals on the correction factor scale to linearly offset the window to a different EGT value on the second EGT scale based on the correction factor.

4,037,783

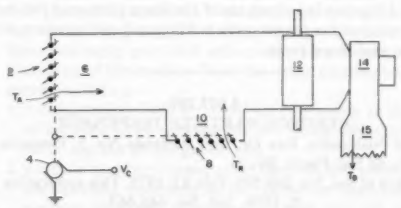
REDUCED OUTSIDE AIR CAPABILITY FOR UNIT VENTILATORS

George J. Bradford, York, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 19, 1976, Ser. No. 659,400

Int. Cl.² F24F 7/00

U.S. Cl. 236—49 **20 Claims**



1. A ventilation apparatus, comprising:

means for delivering tempered outdoor air to a room; and

means for controlling the volume of outdoor air that is tempered in corresponding relation to outdoor air temperature so that the volume of tempered outdoor air delivered to the room remains substantially constant over variations in outdoor temperature.

4,037,784

STEAM TRAP

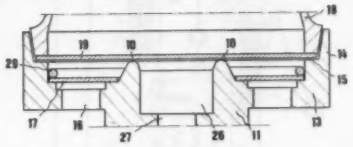
Louis J. Sabarly, Paris, France, assignor to Societe Industrielle des Charmilles, Paris, France

Filed Apr. 1, 1976, Ser. No. 672,670

Claims priority, application France, Apr. 10, 1975, 75.11236

Int. Cl.² F16T 1/10

U.S. Cl. 236—56 **7 Claims**



1. A steam trap construction for allowing the escape of condensate of and from a working fluid under pressure and adapted for mounting in a body having a working fluid chamber communicating with a working fluid inlet and selectively communicating with or closed off from a condensate outlet, said trap construction comprising an enclosure carried by said body, a deformable metal diaphragm carried by said enclosure and dividing the latter into a first chamber and a second chamber, control fluid means in said first chamber under pressure, an annular valve seat extending into said second chamber and communicating via passage means with said outlet, one face of said diaphragm confronting and being capable of seating on said valve seat and its opposite face being exposed to said control fluid, and fluid passage means establishing communication between said working fluid chamber and said second chamber of said enclosure radially outwardly of said valve seat, said diaphragm being deformable to a position off said valve seat when the pressure of said working fluid acting on said one face of said diaphragm exceeds the pressure of said control fluid acting on the opposite face of said diaphragm, whereby fluid may pass from said second chamber into said outlet via said passage means, the area of said one face of said diaphragm exposed to said working fluid being less then the area of the opposite face of said diaphragm exposed to said control fluid when said diaphragm is seated on said valve seat.

4,037,785

COMBINATION SOLAR AND ELECTRIC HEATER

Jean-Pierre Madern, Route de Perpignan, 66330 Cabestany, France

Filed Aug. 18, 1975, Ser. No. 605,291

Claims priority, application France, Aug. 20, 1974, 74.28915; Feb. 3, 1975, 75.03789

Int. Cl.² F24J 3/02

U.S. Cl. 237—1 A **5 Claims**

1. In the combination of a solar heater, a storage container connected to receive heated liquid from and supply cooler liquid to said solar heater, and heat utilizing means connected to receive heated liquid from said storage container and return a cooler liquid to said container, the improvement which comprises:

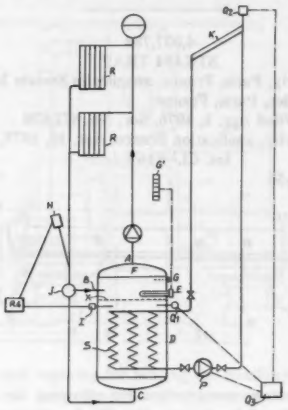
at least one perforated partition dividing said container into upper and lower chambers,

an inlet for heated liquid from said solar heater,

an outlet for said heated liquid supplying said heat utilizing means, and an inlet for cooler liquid from said heat utilizing means, both said inlets and said outlets being located in said upper chamber, with the inlet for cooler liquid from said heat utilizing means below said outlets,

an outlet supplying cooler liquid to said solar heater positioned near the bottom of said upper chamber,

additional heating means in said upper chamber, and



heat responsive means for activating said additional heatng means.

4,037,786

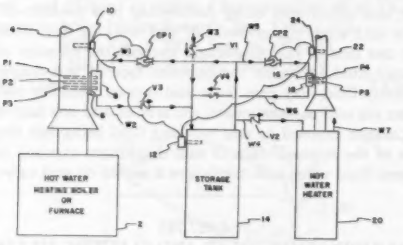
ENERGY RECOVERY AND STORAGE SYSTEM

Patrick Oliver Munroe, Tulsa, Okla., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,051

Int. Cl.[2] F24D *3/08;* **F24H** *1/22*

U.S. Cl. 237—19 **9 Claims**



5. An energy conservation and storage system comprising heat transfer means capable of receiving energy in the form of heat and transferring the heat to a fluid for storage in storage means, means for positioning said heat transfer means to enable a first portion to extend into a flue-stack for contact with flue gases and a second portion to extend outside the flue-stack for contact with fluid in a fluid holding jacket, circulating means for circulating fluid through said fluid holding jacket to remove heat supplied by the heat transfer means and to transfer the fluid to the storage means, a first temperature sensitive control means positioned in said flue-stack and responsive to a first control signal and to a range of temperatures in said flue-stack to control said circulating means and thereby control circulation of fluid through said fluid holding jacket and second temperature sensitive control means coupled to said storage means and responsive to the temperature of the fluid therein to provide said first control signal when the temperature of the fluid in said storage means is less than a predetermined value, thereby to activate said circulating means.

4,037,787

METHOD OF SUPPLEMENTAL IRRIGATION FOR FARMING

Harry A. King, 19361 Trino Circle, Yorba Linda, Calif. 92686

Filed Apr. 19, 1976, Ser. No. 678,249

Int. Cl.[2] E01H *13/00;* **A01G** *13/06*

U.S. Cl. 239—2 R **4 Claims**

1. The method of supplying water to plants and conserving water already in the plant and in the soil comprising: placing in the atmosphere around the plant a fog of water droplets, the majority of which droplets having a diameter between about 10 and about 200 microns, substantially all of which droplets have a diameter no greater than 300 microns, the mass median diameter of all droplets being about 50 microns, whereby the droplets evaporate at a moderate rate and drift substantial distances with slow air movement before reaching the ground, whereby to cover a substantial area of ground with water.

4,037,788

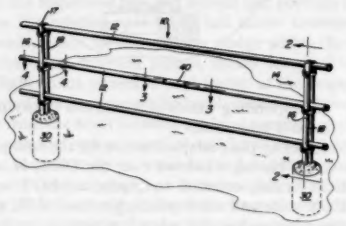
FENCE CONSTRUCTION

Harry D. Riley, 1302 W. Camelback, Phoenix, Ariz. 85013

Filed Dec. 3, 1975, Ser. No. 637,155

Int. Cl.[2] A01G *25/00;* **E04H** *17/14*

U.S. Cl. 239—207 **7 Claims**



1. A fence constructed of rust-resistant metal tubing for the purpose of maintaining stock in a confined area, comprising; fence post means which can be fabricated for supporting fence rails without nuts, bolts, or welding; fence rail means supported by said fence post means, and means for locking said fence rail means to said fence post means in a secure manner, the fence post means includes metal tubing flattened and deformed at the center thereof and bent around the fence rail means for the uppermost rail with the two legs formed after the bending extending downwardly for mounting in the ground, and the fence post means has at least one semi-circular deformed portion in each of the vertical extending leg members for holding round fence rail means secured therewithin and supported between the two leg members, the round fence rail means including tubing of indeterminative length supported by the semi-circular deformed portions in said vertical fence post legs, internally mounted swage-type connectors for connecting the ends of horizontal rails together to form continuous fence rails of any desired length, and locking bands tightly fitting around the two leg members of the fence posts and just below each rail member for securely holding said rail members within and to said fence posts.

4,037,789

AEROSOL-PARTICLE DISPENSER

Shunji Nishimura, Rua Dr. Luiz Miranda No. 5, Pompeia, Estado de Sao Paulo, Brazil

Division of Ser. No. 549,390, Feb. 12, 1975. This application Jan. 5, 1976, Ser. No. 646,667

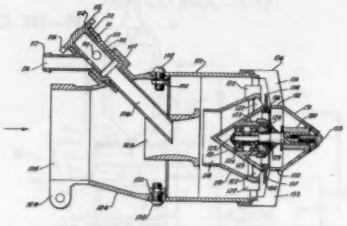
Claims priority, application Brazil, Dec. 27, 1973, 010222; May 13, 1974, 03896

Int. Cl.[2] B05B *7/30*

U.S. Cl. 239—214.17 **12 Claims**

1. A turbine for dispensing aerosol-particles, comprising a

tubular body forming a passage which has an inlet end for a stream of gas, and an outlet end; a venturi mounted in said passage and having an extension which diverges in direction towards said outlet end; an outer hub mounted on said tubular body; a shaft mounted in said outer hub; an inner hub mounted for rotation on said shaft within said extension, defining with an inner circumferential wall surface thereof an annular clearance and carrying a plurality of angularly spaced blades which are located in said clearance; a tubular injector unit extending into said tubular body and having an open end positioned to



discharge into said venturi, said unit having an outer turnable end portion exteriorly of said tubular body and provided with angularly spaced openings of different cross-sectional areas; a housing surrounding said outer end portion; a nipple communicating with said housing and adapted for connection to a source of substance to be dispensed; and an annular member mounted on said inner hub and having a central opening through which said shaft extends, said annular member having a serrated annular marginal portion axially spaced from and located opposite to said annular clearance.

4,037,790

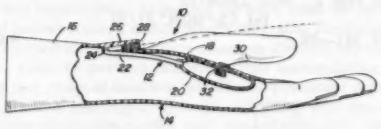
WATER GLOVE

Roger W. Reiser, 3697 Hillcrest Road, and Gary K. Summers, 2440 Pearl St., both of Dubuque, Iowa 52001

Filed Apr. 1, 1976, Ser. No. 672,626

Int. Cl.[2] B05B *9/08*

U.S. Cl. 239—529 **7 Claims**



1. A novelty device, comprising, in combination:

a. spray means for containing an amount of medium to be sprayed and discharging the medium in response to an application of pressure thereon; and

b. carrying means connected to the spray means for supporting the spray means on a user's hand and causing the spray means to be subjected to an application of pressure whenever the user's hand has a force applied thereto, the carrying means being a glove arranged to be worn on a user's hand and being provided with an aperture for permitting discharge of the medium from the spray means, the spray means including:

1. a compressible bulb arranged for containing an amount of medium to be sprayed and for being subjected to a force applied to the glove; and

2. a nozzle member connected to the bulb and arranged in the aperture provided in the glove for directing the medium from the compressible bulb and out of the glove, the glove including a gauntlet and a palm portion, and wherein the aperture is disposed in the gauntlet and the nozzle member is directed in the general direction of the palm portion from the gauntlet.

4,037,791

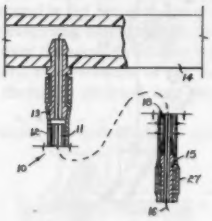
FLOW-CONTROL DEVICE

Leslie Fred Mullett, 29 Grantley Avenue, Victor Harbour, Australia (5211), and Alan James Brock, 26 Strangeways Terrace, North Adelaide, Australia (5006)

Filed Oct. 17, 1975, Ser. No. 623,229

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—542 **13 Claims**



1. A pressure compensated emitter device for controlling rate of liquid discharging from a plenum which contains liquid at superatomspheric pressure, comprising

a discharge tube of comparatively smaller diameter and large length contained within said plenum, the discharge tube having an inlet end within the plenum and a discharge end downstream of the inlet end whereby a pressure gradient occurs between said ends of the discharge tube and a pressure differential exists between the plenum and the space within the discharge tube which increases towards said discharge end, the walls of said discharge tube being sufficiently resilient that the pressure differential reduces the cross-sectional area of at least a portion of said tube and;

a core extending through the tube from one said end to the other, the core having substantially a smooth surface and substantially a constant diameter throughout its length.

4,037,792

CONTINUOUSLY REFINING RAW FIBROUS MATERIAL TO PRODUCE MECHANICAL REFINER PULP

Viking Per Peterson, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sundsvall, Sweden

Continuation of Ser. No. 401,598, Oct. 1, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,226

Claims priority, application Sweden, Oct. 23, 1972, 13653/72; Apr. 3, 1973, 7304665

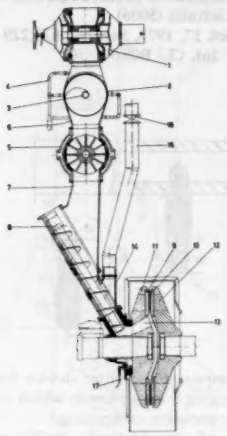
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.[2] B02C *23/26*; D21B *1/14*

U.S. Cl. 241—18 **8 Claims**

1. A continuous method of producing a mechanical refiner pulp from raw fibrous material comprising the steps of preheating said fibrous material in a preheater in the presence of steam under a pressure which exceeds atmospheric pressure to a temperature exceeding 110° C., so as to soften said fibrous material, continuously introducing said softened fibrous material through a conduit to a disc refiner to refine said softened fibrous material between refining surfaces of said disc refiner, without prior defibration, whereby steam is generated in said disc refiner during refining of said softened fibrous material, continuously conducting at least a portion of said steam generated in said disc refiner away from said disc refiner as subsequent fibrous material is continuously being introduced between the refining surfaces of said disc refiner in order to obtain a desired pressure between said refining surfaces of said disc refiner and to prevent the entire amount of said steam generated in said disc refiner from passing between the discs thereof said desired pressure being greater than atmospheric pressure, but less than the pressure in said preheater, and main-

taining the gap between said refining surfaces such that the preheated fibrous material is refined to produce a mechanical



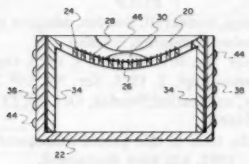
refiner pulp of a sufficiently high quality that can be used for making cardboard or paper.

4,037,793

CITRUS GRATER

Lois J. Puustinen, 3560 Hayden Bridge Road, Springfield, Oreg. 97477

Filed Feb. 27, 1976, Ser. No. 662,151
Int. Cl.[2] A47J *43/25*
U.S. Cl. 241—30 **8 Claims**



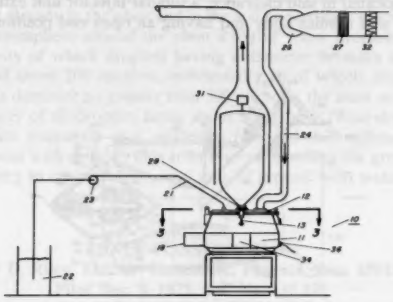
1. A device for gratingly removing the extreme outer oil-bearing portion of the rind from citrus fruits, said device comprising a grating element having a flexible grating surface preformed in a concave, curved shape and flexibly conformable in shape to both spherical and nonspherical convex surfaces when any of said convex surfaces is pressed thereagainst, said grating element having a plurality of apertures formed therethrough, and grating means protruding from said grating surface proximate each of said apertures for penetrating substantially only the extreme outer oil-bearing portion of the rind of a citrus fruit as said fruit is pressed against said grating surface, said grating means protruding from said grating surface a distance sufficient to penetrate said oil-bearing portion of said rind without also substantially penetrating the white inner skin material lying thereunder, whereby, when said citrus fruit is pressed against said grating surface and moved relative thereto, the oil-bearing portion of said rind penetrated by said grating means is gratingly removed from said fruit and forced through said apertures.

4,037,794

GRANULATION APPARATUS

Guido W. Melliger, Dover, N.J., assignor to Dierks & Sohne, Osnabrueck, Germany

Filed Sept. 23, 1974, Ser. No. 508,422
Int. Cl.[2] B02C *23/12*
U.S. Cl. 241—46.17 **11 Claims**



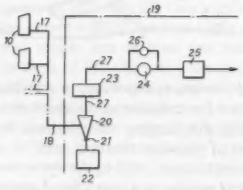
1. In an apparatus for the preparation of dry medicament granulations, an enclosed circular mixing chamber which is axially symmetrical about a vertical axis, sealable first means in communication with the chamber for introducing ungranulated medicament directly into the chamber, second means in communication with the chamber and disposed in spaced relation to the first sealable means for introducing granulating liquids into the chamber, rotatable mixing means supported within the chamber, third means in communication with the chamber for introducing drying air into the chamber, and forth means in communication with the chamber for withdrawing air from the chamber.

4,037,795

WASTE DISPOSAL SYSTEMS

Donald R. Fyfe, 60 Raisins Hill, Pinner, Middlesex, England

Filed Jan. 6, 1976, Ser. No. 646,919
Claims priority, application United Kingdom, Jan. 8, 1975, 853/75; May 17, 1975, 21056/75
Int. Cl.[2] B02C *23/30*
U.S. Cl. 241—58 **8 Claims**



1. A waste disposal system comprising a disposal plant, at least one comminuting machine for separately receiving and comminuting waste, said comminuting machine being disposed remote from said disposal plant and having a loading port for waste, a discharge for communited waste, a duct extending between said discharge and said disposal plant and placing said discharge in constant communication with said disposal plant, suction means for drawing comminuted waste through said duct into said disposal plant, and said suction means being in constant communication with said loading port for maintaining a subatmospheric pressure at said loading port at all times, said communiting machine also including rotaty cutters and grill means, and means mounting said grill means for selective movement between a first position in which said grill means are operatively interposed between said cutters and said dis-

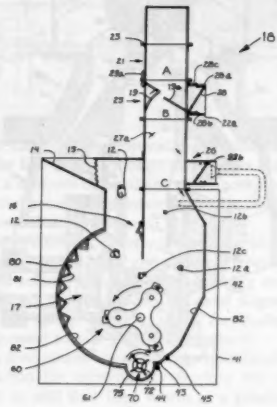
charge and a second position in which said grill means are inoperative by not being so interposed.

4,037,796

ROTARY MILL UTILIZING AN IMPACT REDUCTION CHAMBER AND A VERTICAL AIR FLOW CLASSIFICATION CHAMBER

Peter M. Francis, Las Vegas, Nev., assignor to Industrial Mining Machinery Company, Las Vegas, Nev.

Filed Apr. 13, 1976, Ser. No. 676,477
Int. Cl.[2] B02C *23/12*
U.S. Cl. 241—59 **6 Claims**



1. The improvement in a mill for the crushing and classification of materials comprising: the combination with a housing and drive motor of the following: an intake chute interconnecting with an impact reduction chamber within said housing; an impact rotor connected to said motor and mounted within said impact reduction chamber such that upon rotation of said impact rotor a verticle airflow is produced within said impact reduction chamber; a plurality of impact hammers mounted upon said impact rotor, extending outward from the periphery of said impact rotor; a motor driven reversible fluidizing rotor being located in said reduction chamber directly beneath said impact rotor to prevent materials from accumulating under said impact rotor; at least one classification chamber positioned directly above said impact reduction chamber with open interior communication between said impact reduction chamber and said classification chamber; means within the classification chamber to control the velocity of said vertical air flow caused by the rotation of said rotor; means within the classification chamber to gather materials of a predetermined size which are lifted by said vertical airflow; means cooperative with and connected to the classification chamber for the purpose of exiting the materials from the classification chamber; and means within the classification chamber to direct the movement of vertical airflow within the mill.

4,037,797

GRINDING MILL

Harold E. Stevens, deceased, late of Brigham City, Utah (by Joan Stevens, heiress), assignor to Mill & Mix Company, Inc., Brigham City, Utah

Filed Apr. 29, 1974, Ser. No. 464,794
Int. Cl.[2] B02C *7/14, 7/18*
U.S. Cl. 241—100 **4 Claims**

1. A grinding mill comprising

a housing;

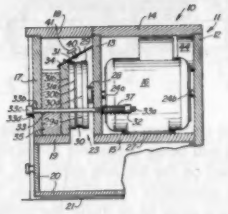
first and second partitions in the housing dividing the housing into compartments;

a motor in a first one of said compartments, said motor having an output shaft extending through said first partition into an adjacent second one of said compartments;

a grinding stone in said second compartment and fixed to and rotatable with said output shaft and a second grinding stone in said second compartment, said second stone being fixed to said second partition and held against rotation relative to said first stone and in face-to-face grinding relationship therewith and said second grinding stone having a hole through the center thereof through which grain to be ground is fed between the stones;

a removable lid extending from the first partition generally downwardly over the second partition within the housing and into a third compartment of the housing whereby grain placed therein is directed into the third compartment;

a floor panel beneath the first and third compartments;



a drawer opening in the housing below the floor panel and the second compartment;

a drawer havng an open top slidable into said drawer housing, whereby said open top is beneath the second compartment to receive material ground between the grinding stones in said compartment;

a hole through the second partition, said hold interconnecting the third compartment and the hole through the second grinding stone;

an access panel in the housing above the second and third compartments, through which grain to be ground can be fed; and

guide means above the drawer in the third compartment for directing grain placed therein through the hole through the second partition and the hole through the second grinding stone to be grounded between said stones before falling from the second compartment to the drawer.

4,037,798

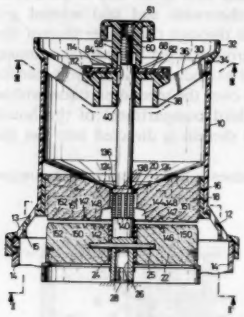
CEREAL MILL

Johann Georg Schnitzer, Feldbergstrasse 26, 7742 St. Georgen, Germany

Filed Sept. 16, 1975, Ser. No. 613,866
Claims priority, application Germany, Sept. 16, 1974, 2444151; Sept. 16, 1974, 2444150; Oct. 4, 1974, 2447380
Int. Cl.[2] B02C *7/14*
U.S. Cl. 241—101.2 **26 Claims**

1. A cereal mill comprising a cylindrical cereal supply container adapted to be placed on a kitchen appliance having a driven shaft, said supply container having a funnel-shaped portion to supply grain to be ground and a cover; an upper millstone fixedly mounted on said supply container below said funnel-shaped portion, said supply container and upper millstone being substantially stationary during the milling operation; a vertical driveshaft extending through said upper millstone and said funnel-shaped portion and being provided at the lower end thereof with coupling means for being coupled to the driven shaft of the kitchen appliance; a lower millstone disposed below said upper millstone and mounted on said driveshaft for common rotation therewith, said upper millstone having a central supply channel dimensioned to feed grain to be ground from said funnel-shaped portion to a milling space

between said millstones; and adjusting means provided at the upper end of said driveshaft and said container for selectively moving said driveshaft along the axial direction thereof relative to said stationary container to adjust the milling space between said millstones, said adjusting means being disposed



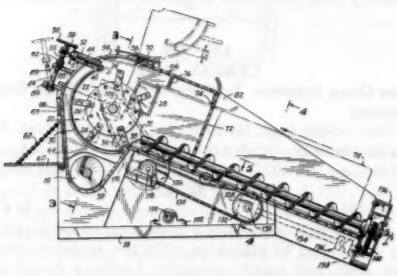
on the opposite end from said coupling means with respect to said millstones and being accessible for adjustments when said mill is supported on the kitchen appliance, whereby said millstones may be adjustably spaced from one another to change the milling space prior to or durig the milling operation.

4,037,799

PORTABLE HAMMERMILL AND ATTACHED INCLINED AUGERED FEED TABLE

Guy K. Urban, deceased, late of Lancaster, Pa. (by Mary Urban, administratrix/executrix), assignor to Feedmobile, Inc., Lititz, Pa.

Filed Apr. 30, 1975, Ser. No. 573,026
Int. Cl.[2] B02C *13/286*
U.S. Cl. 241—186 A **10 Claims**



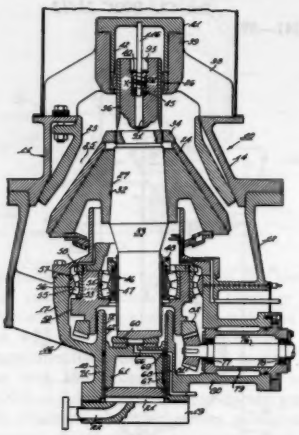
1. A hammermill comprising a housing defining a grinding chamber having a rotor with a plurality of swinging hammers and a removable screen; an open material-receiving trough forming a feed table on one side of the housing; at least one pair of counter-rotating augers rotatively supported within said trough and flighting disposed about said augers for feeding material to be processed directly upwardly at an angle into the rotor and grinding chamber of said hammermill; said feed table rigidly affixed to said rotor housing and residing in a plane passing through the plane of said rotor, and means for rotating said rotor and said augers.

4,037,800

GYRATORY CRUSHER HAVING ANTISPIN DEVICE FOR HEAD

Major Coxhill, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 8, 1976, Ser. No. 693,785
Int. Cl.[2] B02C *2/04*
U.S. Cl. 241—213 **3 Claims**



1. In a gyratory crusher having a frame including a spider, a crusher head carried by a shaft which is supported by the frame for rotation about its own axis and for gyratory movement about the axis of the frame and a drive eccentric operable to effect the gyratory movement of the shaft and crusher head:

an axial bore in the shaft, said axial bore having a counterbore;

a first ratchet plate having an axial opening the diameter of which is substantially equal to the diameter of said bore in the shaft, said first ratchet being disposed at the bottom of the counterbore and secured therein to rotate with the shaft;

a second ratchet plate disposed in the counterbore in operating engagement with said first ratchet plate;

means in said second ratchet plate defining a non-circular opening therethrough;

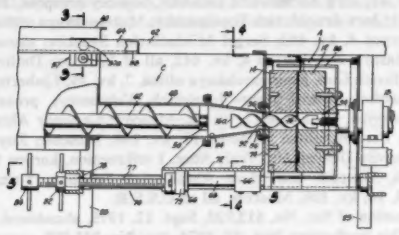
a torsion rod of noncircular configuration of cross-section secured to the spider and depending downwardly therefrom into said axial bore formed in the shaft, said torsion rod extending through the openings in said first and second ratchet plates, said opening in said second ratchet plate being sized to give clearance to said torsion rod in all vertical positions of the shaft but sufficiently small enough wherein upon limited rotation of said second ratchet plate the sides of the opening engage with said torsion rod to stop further rotation of said second ratchet whereupon said first and second ratchet plates in cooperation with said torsion rod operate to prevent the further rotation of the shaft in the direction in which the drive eccentric is rotating; and,

a spring confined within the counterbore and acting against said second ratchet plate to bias said second ratchet plate into operating engagement with said first ratchet plate, said spring yielding when the crusher is under load to permit the shaft to rotate in a direction opposite to the direction in which the drive eccentric is rotating.

4,037,801
GRINDING APPARATUS

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Filed Mar. 1, 1976, Ser. No. 662,457
Int. Cl.[2] B02C 7/14, 7/16
U.S. Cl. 241—247 4 Claims



1. A material grinding apparatus for continuously grinding corn and the like in a manner to provide an output of ground material at a uniform controllable rate, comprising:

a. a material grinding chamber having an opening for receiving material to be ground;

b. first and second cooperating material grinding members in said chamber, said first grinding memeber being rotatable and said second grinding member being nonrotatable;

c. a first feed worm disposed in axial alignment with the opening in said grinding chamber for feeding the material to be ground to said grinding members;

d. a force feed means cooperatively associated with said first feed worm for controllably feeding the material to be ground to said first feed worm at a predetermined rate, said force feed means comprising:

1. a material dispensing hopper;

2. a second feed worm disposed in axial alignment with said first feed worm and cooperatively associated therewith for receiving the material from said hopper and feeding it to said first feed worm; and

3. a frustoconically shaped nozzle disposed intermediate said second feed worm and said material grinding chamber, said nozzle having a rearward opening and a smaller diameter forward opening adapted to telescopically receive at least a portion of said first feed worm; and

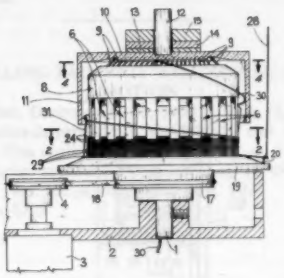
e. a carriage means reciprocably movable toward and away from said first grinding member for carrying said second nonrotatable material grinding member and said force feed means whereby said second grinding member can be moved into and out of material grinding engagement with said first grinding member.

4,037,802
APPARATUS FOR STORING AND FEEDING YARN TO YARN USING MACHINES

Sergio Calamani, Via Settima, 27, Segrate San Felice, Milan; Eugenio Turri, Via Benedetto Marcello, 1, and Ermanno Savio, Via Garofalo 22, both of Milan, all of Italy

Filed Apr. 7, 1975, Ser. No. 565,608
Claims priority, application Italy, Apr. 10, 1974, 21212/74; Aug. 7, 1974, 26113/74; Oct. 21, 1974, 28631/74
Int. Cl.[2] B65H 51/20
U.S. Cl. 242—47.05 12 Claims

1. An apparatus for storing and feeding yarn to a yarn using machine comprising; a substantially upright hollow shaft containing a bore, a substantially cylindrical drum containing an outer surface with upper and lower portions thereof, distributing means for distributing yarn as windings on the said outer surface of said drum and then through said bore of said hollow shaft, driving means for producing relative rotational movement between said distributing means and said drum, translating means for causing said yarn windings to be translated from the lower to the upper portion of said outer surface of said drum while separating said windings from one another, and variable tension controlling means for braking and providing a variable range of tension to the yarn which is leaving said apparatus and being fed to said yarn using machine, said variable tension controlling means comprising; a bell member containing a base wall and a peripheral wall, said bell member being positioned above said drum such that the base wall is



spaced apart from the drum top and the peripheral wall is spaced apart from the outer surface of said drum, an annular member coaxial with said shaft and coupled to said drum, and a plurality of inwardly projecting flexible elongated fingers secured to one of said members and having free ends contacting the other member for support of the bell member on the annular member, said fingers being inclined in the direction of the yarn movement during the run off from

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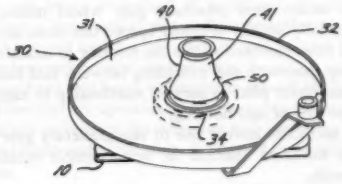
4,037,803
CENTER FEED UNWINDER

Paul E. Becking, San Mateo, Calif., assignor to Data-Link Corporation, San Mateo, Calif.

Continuation of Ser. No. 300,875, Oct. 25, 1972, abandoned, which is a continuation of Ser. No. 873,812, Nov. 4, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,738
Int. Cl.[2] G11B 23/00; B65H 25/22
U.S. Cl. 242—55.18 20 Claims



1. Center feed tape unwinder comprising:

a rotatable tape storage bowl; and

a cone member extending outwardly at the center of said bowl, about which tape may spiral; said cone member including at least an upper and a lower inwardly and upwardly tapering conical portion with said upper conical portion having a surface with a substantially greater coefficient of friction with tape than the surface of said lower conical portion;

said cone member further including a primary cone;

said upper portion being a conical boot surrounding the upper part of said primary cone; and

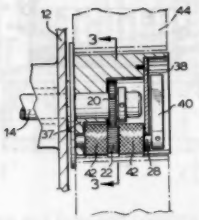
said lower portion being a secondary cone surrounding the lower part of said primary cone.

4,037,804

LOCKING MECHANISM

Slavco A. Kopachkov, Toronto, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed June 23, 1976, Ser. No. 698,950
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—68.3 6 Claims



1. A locking mechanism comprising:

a hollow cylindrical housing having a circular base plate, wall means upstanding from and integral with said base plate and a circular cover plate closing an open end of said housing,

an axle extending through said base plate axially of and into said housing in non-rotatable relationship therewith,

sun gear wheel means mounted on said axle within said housing for rotation therewith,

three planetary gear wheel means located within said housing, said planetary gear wheel means being arranged in planetary fashion about and enmeshed with said sun gear wheel means, said planetary gear wheel means being substantially equally orbitally spaced one from another,

elongate axles mounted within the housing in rotatable relationship therewith and extending between said base plate and said cover plate in parallel relationship to each other and the axis of said housing,

each of said axles having one of said planetary gear wheel means mounted thereon in non-rotatable relationship therewith,

three circumferentially spaced axial slots formed in said wall means and arranged in radial alignment with said elongate axles,

at least one cylindrical gripping member eccentrically mounted on each of said elongate axles for rotation therewith between a first position in which each of said gripping members is simultaneously positioned wholly within the periphery of said wall means and a second position in which a portion of each of said gripping members simultaneously projects through the adjacent one of said slots and outside said periphery of said wall means, and

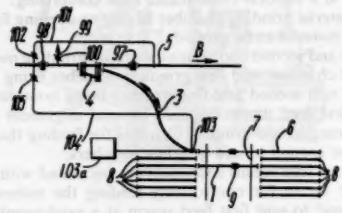
actuation means associated with one of said elongate axles for rotation of the same to cause simultaneous rotation of all said elongate axles and simultaneous movement of said gripping members between said first and second positions thereof.

4,037,805

ASSEMBLING AND REPAIR STATION OF A PLANT FOR PNEUMATIC TRANSPORTATION OF GOODS IN CONTAINERS THROUGH A PIPELINE

Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 442; Sergei Mikhailovich Susekov, shosse Entuziastov, 208, korpus 4, kv. 442, all of Moscow; Dmitry Rudolfovich Gun, Komsomolskaya ulitsa, 7, kv. 29, Ljubertsy Moskovskoi oblasti; Igor Igorievich Volyansky, proezd Stratonavtov, 12, korpus 1, kv. 12, Moscow; Gennady Alexeevich Pertsev, ulitsa Svoboda, 17, kv. 148, Moscow; Zoya Timofeevna Devyatkina, Teply Stan, 1 mikroraion, korpus 1, kv. 48, Moscow, and Mark Abramovich Feldman, Yasny proezd, 14, kv. 100, Moscow, all of U.S.S.R.

Continuation of Ser. No. 612,920, Sept. 12, 1975, abandoned.
This application Nov. 17, 1976, Ser. No. 742,609
Int. Cl.[2] B65G *51/04*
U.S. Cl. 243—38 7 Claims



1. An assembling and repair station of a plant for pneumatic transportation of goods in containers through a pipeline, comprising: a switch means having one end thereof connected with said pipeline; a container-receiving trough connectable for receiving the containers with the other end of said switch means; a device for arresting the containers, connectable for receiving the containers with the opposite end of said container-receiving trough; a device for advancing the containers along said container-receiving trough, mounted on said trough movably therealong; means for driving said container-advancing device longitudinally of said trough; guideways extending substantially perpendicularly to the center line of said container-receiving trough; said container-receiving trough being mounted on said guideways for reciprocation therealong; means for driving said trough along said guideways; a plurality of troughs adapted to accommodate therein the containers for their maintenance and repair, arranged at both sides of said guideways parallel with one another, so that the respective center lines thereof are parallel with the center line of said container-receiving trough and coaxially aligned therewith, as said container-receiving trough is brought into opposition to either one of said plurality of said container-accommodating troughs.

4,037,806

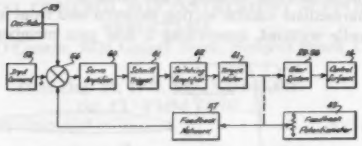
CONTROL SYSTEM FOR ROLLING MISSILE WITH TARGET SEEKER HEAD

Joseph G. Hirsch, Diamond Bar; Jack L. Hoffa, Brea; Garry T. Lacy, Claremont, and Jerry M. Mowell, Covina, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 16, 1964, Ser. No. 397,674
Int. Cl.[2] F42B *13/30*
U.S. Cl. 244—3.16 19 Claims

1. A control system adapted to effect flight control of a rolling missile, said control system comprising a target seeker head mounted to the body of said missile and having means for generating electrical signals in accordance with the relative positions of the missile and an associated target, a plurality of

fixed area lift producing variable incidence control surfaces extendable upon launch from within the missile body into the missile's airstream and adapted to dither in the extended position for eliminating the inertial force caused by initial movement thereof, actuator means for extending said control surfaces from within said missile body and locking same in the extended position, means engaged with said control surfaces and operable to vary the incidence of said control surfaces when actuated by electrical control signals, said actuator



means including electrical means for continuously dithering said control surfaces, electronic means connected to said seeker head and said actuator means to receive the electrical signals from said seeker head and transform them into actuator control signals, said electronic means being operably connected with said dithering means, whereby the incidence angle of the control surfaces is selectively varied during that portion of the missile's roll necessary to keep the missile on a target intercept course while continuously dithering said control surfaces.

4,037,807

FLIGHT VEHICLE

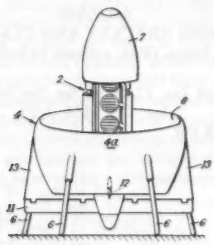
Thomas Johnston, Belfast 5, and Frederick Peter Youens, Holywood, County Down, both of Northern Ireland, assignors to Short Brothers and Harland Limited, Belfast, Northern Ireland

Continuation of Ser. No. 393,231, Aug. 30, 1973, abandoned. This application June 20, 1975, Ser. No. 588,882

Claims priority, application United Kingdom, Sept. 1, 1972, 40721/72

Int. Cl.[2] B64C *29/02*

U.S. Cl. 244—7 B **20 Claims**



1. A flight vehicle comprising a duct of aerofoil cross-section which provides lift with the vehicle in a forward flight mode;

flow induction means for inducing a flow of ambient air through the duct to provide a thrust greater than the weight of the vehicle, which thrust acts along the axis of the duct to enable the vehicle to take-off with the axis of the duct vertical; and

means for controlling the attitude of said vehicle, said control means including adjustable control surfaces located in the flow of ambient air induced by the flow induction means to counteract moments produced on the vehicle by forward flight without substantial re-direction of the thrust by the control surfaces, and wings mounted on opposite sides of the outer surface of the duct and having trailing ends extending beyond the outlet end of the duct, the wings extending into the air stream around the outer surface of the duct in at least one plane generally parallel to the duct axis to modify the air flow around the outer surface of the duct to reduce pitching moments on the vehicle at high angles of incidence of the vehicle whereby the counteracting moments required from the control surfaces to overcome said pitching moments is reduced and the vehicle remains stable at such high angles of incidence, said wings also providing lift at low angles of incidence.

4,037,808

TRAVELLING TAIL-UNIT WITH CIRCULAR ARC MOTION

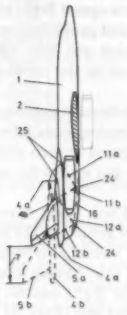
Herbert Kaniut, Orrerweg 33/35, 5000 Cologne 71, Germany

Continuation-in-part of Ser. No. 508,319, Dec. 4, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 659,140

Claims priority, application Germany, Aug. 16, 1974, 2439479

Int. Cl.[2] B64D *33/02;* **B64C** *5/10*

U.S. Cl. 244—53 B **17 Claims**



1. An aircraft having a travelling tail unit which is movable in longitudinal direction of aircraft by means of circular arc motions comprising:

a fuselage **(1)**,

a pair of fixed wings **(2)** with ailerons, landing flaps, slats, jet engines **(3; 23; 33)** mounted on said aircraft,

a startbooster jet engine **(13)** accommodated inside of the aft end of said fuselage,

a tail unit being composed of a tail unit-chassis **(4a; 4b)** having a longitudinal and airflow suitable shape and at least two tail surfaces, the parts of said tail unit forming a common monocoque construction,.

a. the said tail unit being substantially moved along the path of a circular arc upwards and rearwards into the rearward position increasing the effective tail unit lever for low-speed flight and particularly for takeoff and landing operations,

b. the said tail unit being substantially moved along the path of a circular arc forwards and downwards into the forward position for high-speed flight,

c. the said tail unit in its forward high-speed flight position being placed in a horizontal distance behind the trailing edges of said wings, from which forward position the said tail unit is moved rearwards into the position for low-speed flight and vice versa (FIG. **1**; FIG. **2**; FIG. **4** and FIG. **5**),

d. the said tail unit-chassis being connected with the aft end of said fuselage by means of two front swivel arms (**11** with positions **11***a* and **11***b*) and two hind swivel arms (**12** with positions **12***a* and **12***b*),

e. the said two front swivel arms **(11)** being with each other connected by means of crossbeams **(26)** into a front swivel arm-frame (FIG. **12**), and the said two hind swivel arms **(12)** being with each other connected by

means of crossbeams (26) into a hind swivel arm-frame (analogous to FIG. 12), both said frames having rigid frame corners,

f. the said swivel arm-frames lying with their frame planes substantially transversally to the direction of flight,

g. the said swivel arm-frames having hinges on their corners, particularly each said swivel arm-frame having two lower hinges (24) on its two lower corners connecting said swivel arm-frame with the aft end of said fuselage and two upper hinges (25) on its two upper corners connecting said swivel arm-frame with said tail unit-chassis (FIG. 2; FIG. 5 and FIG. 9 to FIG. 12),

h. the said tail unit-chassis in its forward high-speed flight position (4a) being joined in an airflow suitable manner to said aft end of said fuselage,

i. the said tail unit-chassis in its forward high-speed flight position (4a) being used as an airflow suitable fairing for said startbooster jet engine (13) when it is stopped during high-speed flight (FIG. 2; FIG. 3 and FIG. 5 to FIG. 9), whereas said tail unit-chasses moved into its rearward low-speed flight position (4b) uncovers the air intake (14) and propelling nozzle of said startbooster jet engine, which put into operation (15) increases the takeoff thrust or the zoom away thrust of the air-craft (FIG. 10),

increases the propulsion redundancy, makes the design of the main jet engines simpler, especially for supersonic aircraft, and being specially adpated to zero altitude conditions, reduces the fuel consumption, and makes the exhaust emissions on airfields cleaner,

j. the said tail unit being moved rearwards and forwards by means of actuators (21 and 22) coupled with at least one of said swivel arm-frames (FIG. 10 and FIG. 11),

k. the said tail unit having control linkages continuously connecting the flight control means with the contol surfaces of said tail unit (FIG. 11 and FIG. 12), and each said control linkage is transmitting a separate control command to a separate control surface,

l. the said startbooster jet engine (13) having its air intake through the inner opening of said front swivel arm-frame, and its propelling nozzle positioned inside of the inner opening of said hind swivel arm-frame (FIG. 9 and FIG. 10),

m. the said tail unit arrangement having a crossbond (20) consisting of two rods in X-shape and being horizontally inserted into the front end of the upper cutout of the rear fuselage, diagonally connecting the left front end of the fuselage cutout with the right and rear fuselage side wall, and the right front end of the fuselage cutout with the left and rear fuselage side wall, penetrating the inner opening of said front swivel arm-frame (FIG. 1; FIG. 4; FIG. 10 and FIG. 12), whilst said cross-bond is increasing the torsional stiffness of said fuselage aft end,

n. the said fuselage (1) having a channel (16) in its rear bottom side.

4,037,809

DEVICE FOR MOUNTING A TURBOREACTOR ON AN AEROPLANE

Paul Joseph Legrand, Vaux le Penil, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 12, 1975, Ser. No. 631,196
Claims priority, application France, Nov. 13, 1974, 74.37468
Int. Cl.[2] B64D *27/16, 29/08*
U.S. Cl. 244—54 **9 Claims**

1. A composite nacelle for housing on an airframe a turbojet engine developing forces, comprising:

a front nacelle section forming an air intake,

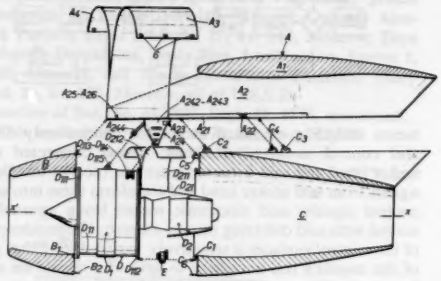
a compressor casing having an upstream end connected to said air intake and a downstream end axially spaced from said upstream end, said compressor casing being integral with said turbojet engine,

a mast member integral with said airframe,

unitary linking means between said mast member and said compressor casing for both supporting said turbojet engine and for transmitting said forces therefrom to said airframe,

a rear nacelle section having an upstream end connected with the downstream end of the compressor casing and a downstream end forming a gas exhaust,

an intermediate nacelle section between said front and rear nacelle sections, comprising a side gate member selectively movable to a closing position wherein said side gate member covers said unitary linking means and said compressor casing and to an opening position wherein said side gate member provides access thereto,



quick release locking means for connecting said rear nacelle section to said downstream end of the compressor casing,

sliding guide means between said rear nacelle section and said mast member for permitting longitudinal relative displacement of said rear nacelle section, and

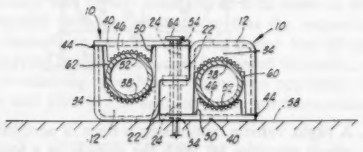
means for releasably connecting said rear nacelle section to said mast member to permit said longitudinal relative displacement of said rear nacelle section, whereby practical maintenance of said turbojet engine is made possible.

4,037,810

PIPE BRACKET AND CLAMP

Harold T. Pate, Solon, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,468
Int. Cl.[2] F16L *3/22*
U.S. Cl. 248—68 CB **18 Claims**



1. A pipe clamp comprising:

a body portion having a pipe-receiving recess therein and first aperture means therethrough;

flexible hinge means on said body portion;

a clamping portion connected to said hinge means and having second aperture means formed therein, said clamping portion being adapted to fold about said hinge means relative to said body portion to bring said first aperture means and second aperture means into mutual alignment for receiving a fastener member therethrough;

cover means having one end flexibly connected to said clamping portion for extending across and blocking said first aperture means when said clamping portion is folded about said hinge means relative to said body portion;

closure means on said cover means insertible in and registerable with a portion of said first aperture means; and

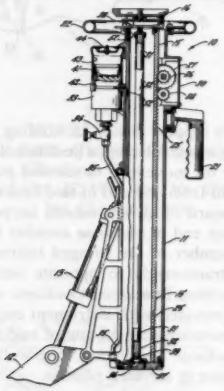
a festening member extending through said second aperture means and into a portion of said first aperture means and protectively covered and blocked by said closure means to prevent exposure of the fastening member to unauthorized removal and to corrosive elements.

4,037,811

VERTICAL CONTROL FOR INSTRUMENT SUPPORT STRUCTURE

Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660

Filed Dec. 24, 1975, Ser. No. 644,141
Int. Cl.[2] F16M *11/00*
U.S. Cl. 248—162 **5 Claims**



1. In an instrument support structure having a column intended to be vertically disposed and a post slidably fitted for telescoping movement in the column, the combination comprising, a cylinder mounted in the lower end of said column and extending up into said post, a rod fixed to the upper end of said post and being slidably fitted in said cylinder, a hydraulic reservoir fitted on said column and being in fluid communication with the lower end of said cylinder, means for establishing and maintaining a variable pressure on said fluid so as to exert a force on said rod counterbalancing the weight of and on said post, said cylinder and rod being interfitted through a length at least as long as the full range of movement of said post in said column, and a crank mounted on said column and geared to said post for vertically moving the counterbalanced post in the column.

4,037,812

ADAPTABLE ENCLOSURE MOUNTING SYSTEM

John William Pausche, Norridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 2, 1975, Ser. No. 609,263
Int. Cl.[2] F16M *13/02*
U.S. Cl. 248—218.4 **6 Claims**

1. An adjustable mounting assembly for attaching a lockable equipment enclosure or the like to a hollow pole, the pole having at least one aperture in a wall, the assembly comprising:

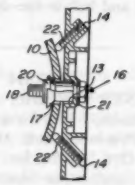
a bracket means having at least one cylindrical cavity formed in the back surface thereof, each cavity having in the bottom thereof an aperture smaller in diameter than the cavity, the bracket means having at least one mounting aperture and the bracket means having at least one threaded bore on each side of the vertical center line thereof, the longitudinal axis of each bore being angled from front to rear toward said vertical center line a the cylindrical cavity aperture, the mounting apertures, and the front openings of the threaded bores being positioned for being covered by a portion of the attached enclosure;

screw means for mating with each angled bore and adapted to being advanced within the bore into contact with the exterior of the hollow pole;

at least one subassembly for attaching the bracket to the pole, each subassembly comprising:

a tubular member having an outside diameter less than the inside diameter of the cylindrical cavity of the bracket means, having a length substantially greater than the depth of the cylindrical cavity and having a plurality of slots formed therein extending from one end of the member and along a substantial portion of the longitudinal dimension of the member;

a threaded bolt insertable in the tubular member, having a body diameter smaller than the aperture in the bottom of the cylindrical cavities, and having the longitudinal



dimension of the body portion longer than the length of the tubular member;

a threaded member adapted to mate with the bolt and having a first portion of an outside diameter less than the inside diameter of the tubular element, having a second portion of a diameter substantially larger than the first portion, and having a third, tapered portion, joined to and connecting the first and second portions; and

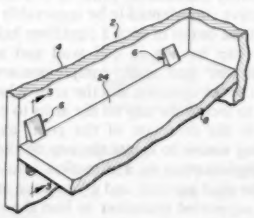
wherein the apertures in the pole are dimensioned to provide a close fit for the second portion of the threaded member, whereby subsequent to installation of the subassemblies in the cylindrical cavities of the bracket means and insertion through the apertures in the hollow pole, rotation of the bolts will cause the bolts to advance within the threaded member, causing the slotted ends of the tubular members to expand, locking the bracket to the hollow pole.

4,037,813

SHELF SUPPORT

Phillip J. Loui, Chicago, and James A. Schmidt, Jr., Berwyn, both of Ill., assignors to Handy Button Machine Company, Chicago, Ill.

Filed June 7, 1976, Ser. No. 693,355
Int. Cl.[2] A47B *57/04*
U.S. Cl. 248—250 **6 Claims**



1. A one-piece plastic member for supporting an edge portion of a shelf on an upright and wherein the upright has at least one opening therein, comprising a back portion having a

first section, a second section and a third section, said sections being contiguous and in end-to-end relationship, at least one of said first and second sections having a region for engagement with said upright, a flange projecting from one side of said back portion to provide a support for the edge portion of the shelf, said flange being substantially at the junction of said first and second sections, a stem projecting from the opposite side of said first section for engagement in said opening, said second and third sections being resilient and forming an obtuse angle, a shoulder substantially at the vertex of said obtuse angle and being presented toward said flange and being spaced therefrom to cooperate with said flange for retaining the said shelf edge portion therebetween, said second and third section tending to flatten within elastic limits and increase said angle as the shelf edge portion is moved over said third portion and past said shoulder, whereupon the second and third sections snap back to cause the shoulder to retain said shelf edge portion, a portion of the third section remote from said shoulder having a region for engagement with said upright such that two regions are respectively above and below the shelf when the latter is on said flange.

4,037,814

CONTAINER SUPPORT AND HOLDER

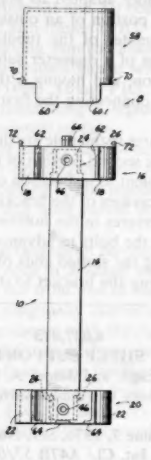
Anthony Robin Clausen, 7 Klip Street, Observatory, Johannesburg, Transvaal Province, South Africa

Filed Oct. 7, 1974, Ser. No. 512,572

Claims priority, application South Africa, Oct. 18, 1973, 73/8107

Int. Cl.[2] A47F *1/00*; A62C *31/78*

U.S. Cl. 248—311.1 **10 Claims**



1. A container support for supporting a tubular container having an outlet at its one end, and comprising a holder having a pair of resiliently expandable arms to embrace such a container, a protective cap adapted to be removably located on the arms to protect the outlet of such a container held by the arms, the protective cap having an end wall and a skirt portion extending from the end wall, complementary engagement formations on the skirt portion and the arms which are adapted to be engaged to locate the cap on the arms to combat relative displacement in the direction of the polar axis of the skirt portion, locating means to locate the cap on the arms to combat relative displacement in a direction transversely to the polar axis of the skirt portion, and a bias zone on the cap to be engaged by a supported container to bias the cap away from the arms against the action of the engaged complementary engagement formations during withdrawal of such a container from the arms in a direction transversely to the polar axis of the container, the complementary engagement formations being adapted to become disengaged when the arms have been expanded by such a container during withdrawal thereof, to allow the biassing action so generated to cause the cap to flip off upon disengagement of the engagement formations.

4,037,815

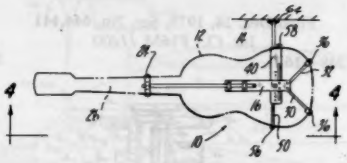
MUSICAL INSTRUMENT SUPPORT

Arthur D. DeLano, Battle Creek, Mich., assignor to D & J Products, Battle Creek, Mich.

Filed July 19, 1976, Ser. No. 706,699

Int. Cl.[2] A47F *5/00*

U.S. Cl. 248—285 **11 Claims**



1. An adjustable support device for holding stringed instruments comprising; a base member, a neck bracket supported on said base member for movement to selected positions longitudinally thereof and from one end of said base member to support the finger board of an instrument, support means connected to the other end of said base member for engagement with the body member of the stringed instrument, a pair of arms extending transversely to opposite sides of said base member for adjustment to selected positions, said free ends of said arms being provided with instrument engaging portions, and bracket means connected to one of said arms and being adapted for detachable connection to a wall or the like to maintain said device in elevated position.

4,037,816

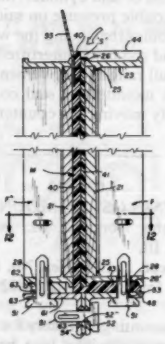
APPARATUS FOR FORMING A LINER ON A PLANAR FORM MEANS

Samuel C. Scott, 2519 Walnut St., Denver, Colo. 80205

Filed Apr. 23, 1976, Ser. No. 679,674

Int. Cl.[2] B29C *1/02*

U.S. Cl. 249—83 **10 Claims**



1. Apparatus for producing a flexible resilient polymeric liner and for bonding said liner to modular components of planar concrete forms for producing large planar, decorative concrete walls and the like comprising:

a. master mold means formed of flexible, resilient polymeric material including a planar section and integral flanges depending normally from the plane of said section around the edges of three adjacent sides and jointed together at the corners, there being a shallow, internal groove in said

flanges adjacent said planar section, with rigid backing means attached to and supporting the resilient polymeric material of said planar section and said flanges,

b. modular planar form means sized to seat in and be sealed by said flanges around three edges thereof with each one of said edges in sealing communication with said groove,

c. removable means inclusive of wedging pins securing said master mold means with said modular planar form means with the planar section of said master mold means in generally parallel position with said modular planar form means, and

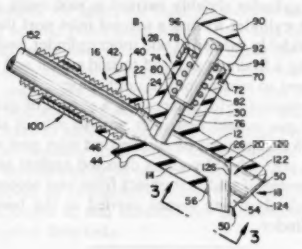
d. supportive means on which said master mold means and said modular planar form means are non-permanently mounted for support in an upright position with said flanges along the sides and bottom of the assembly.

4,037,817

PINCH TUBE VALVE

John A. Chernak, BedfordHeights, Ohio, assignor to Tomlinson Industries, Inc., Cleveland, Ohio

Filed Oct. 28, 1975, Ser. No. 626,493
Int. Cl.² F16K *7/06*
U.S. Cl. 251—7 **13 Claims**



1. A pinch tube type valve for use in selectively controlling liquid flow through a flexible tube wherein the valve includes a valve body having an inlet end, an outlet end, a passageway connecting said inlet and outlet ends, an upper surface and a lower surface with said flexible tube adapted to be passed through said passageway with the outermost end thereof disposed adjacent said valve body outlet end, said pinch tube valve further including separate means communicating with said passageway for selectively closing said flexible tube to control liquid flow therethrough, the improvement comprising:

tube receiving means comprising an apertured area in the lower surface of said valve body adjacent said outlet end extending generally longitudinally along a portion of said lower surface from said outlet end toward said inlet end for receiving the outermost end of said tube in a particular desired position angularly disposed of said passageway for dispensing liquid therefrom; and,

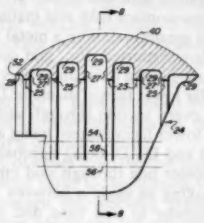
a stop member selectively receivable in said passageway from said outlet end, said stop member including a shank portion adapted to extend inwardly through a portion of said passageway from said outlet end to retain said outermost end of said flexible tube in said angularly disposed position, said stop member shank portion being dimensioned to extend into said passageway a distance less than the longitudinal extension of said aperture along said lower surface from said outlet end.

4,037,818

CONTROL VALVE

Roy E. Soderberg, and Albert J. Hanssen, both of North Kingstown, R.I., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 26, 1975, Ser. No. 607,749
Int. Cl.² F16K *5/10, 47/04*
U.S. Cl. 251—121 **20 Claims**



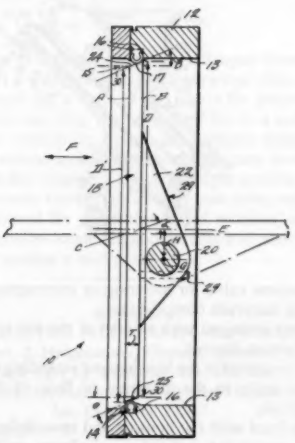
1. A control valve of the type having inlet and outlet apertures and a rotatable valve plug with a surface defining a flow passage for communicating with said inlet and outlet apertures, wherein the improvement comprises a plurality of baffle elements each formed on said surface and having first and second surfaces and extending transversely into said flow passage, the surfaces of adjacent baffle elements being spaced apart for controlling fluid flow characteristics through said valve.

4,037,819

BUTTERFLY VALVE HAVING METAL-TO-METAL SEALING WITH CONICAL ANGLE-TRANSPORTED VANE

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr Valves Inc., Glens Falls, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,614
Int. Cl.² F16K *1/226*
U.S. Cl. 251—306 **5 Claims**



1. A butterfly valve comprising:

a body member having a substantially circular bore therethrough, fluid adapted to flow through said bore in a given direction,

a metal annular valve seat member,

means for mounting said annular valve seat member in said bore so that said annular member has a mating surface thereof disposed in said substantially circular bore and so

that said annular valve seat member is radially movable with respect to said circular bore both toward and away an axis of said bore, said mounting means including a valve seat opening formed in said body member in communication with said substantially circular bore and having border surfaces, said valve seat having surfaces thereof engaging said border surfaces of said valve seat opening and preventing flow of fluid in said circular bore except interiorly of said mating surface,

means for cooperating with said metal valve seat member to form circular line contact with said mating surface of said valve seat, said means including a metal vane comprising a conical angle-transported disc, said conical angle-transported disc vane having a circular upper face of diameter D′ and a circular lower face of diameter D slightly greater than D′, with every section through said disc parallel to the upper and lower faces thereof being a circle of diameter between D and D′, D′ being approximately 99/100th of D, and a center line through said circular upper and lower faces making an angle α between 20° and 40° with a line perpendicular to said vane disc upper and lower faces,

said annular valve seat member having an inner diameter approximately midway between D and D′, and

shaft means for mounting said vane for rotation about an axis substantially perpendicular to the direction of fluid flow through said bore for movement from a first position wherein fluid may flow past said vane through said circular bore, to a second position wherein said vane is in circular line contact with said valve seat member and no fluid may flow there-past, said shaft means being attached to one face of said vane spaced a small distance therefrom.

4,037,820

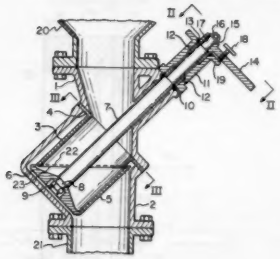
SEATLESS VALVE

Richard L. Lowe, 1906 Shaler Drive, Glenshaw, Pa. 15116

Filed Aug. 12, 1976, Ser. No. 713,715

Int. Cl.[2] F16K *5/04*

U.S. Cl. 251—310 **11 Claims**



1. A seatless valve for metering or interrupting the flow of particulate materials comprising,

a housing arranged with an inlet at the top and an outlet at the bottom thereof,

a shaft journaled in the housing and extending thereinto at an acute angle to the direction of flow of the particulate materials,

a spout fixed with the housing and spaced therefrom generally comprising a circular cylindrical wall coaxial with said shaft, said spout opening at the upper end thereby in communication with the inlet to the housing and said spout opening at the lower end,

a rotor gate fixed to turn with said shaft, said gate comprising a radially extending base and a cylindrical wall coaxial with said shaft and spout, the cylindrical wall of said gate having an inner diameter greater than the outer diameter of the cylindrical wall of the spout, the base and cylindrical wall of said gate having minimal spacing from said spout at all angular positions of said shaft and gate, said cylindrical wall of said gate being cut away such that at one angular position of the shaft and gate, flow through the valve is unobstructed and in another angular position of the shaft and gate, the gate without touching the spout causes the area of repose of the material falling from the spout to be occupied thus stopping flow and in intermediate angular positions of the shaft and gate, particle flow is metered.

4,037,821

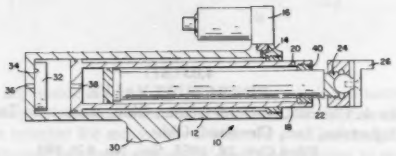
TELESCOPING RETRACTOR

Frank E. Greene, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 10, 1976, Ser. No. 713,151

Int. Cl.[2] B66F *3/24*

U.S. Cl. 254—93 R **1 Claim**



1. A telescoping retraction device for rapidly withdrawing an umbilical connector from a missile comprising:

a. an outer cylinder having a first inlet port therein;

b. an inner cylinder slidably carried in said outer cylinder, said inner cylinder having a second inlet port therein;

c. a piston slidably carried in said inner cylinder, and a piston rod having a first end secured to said piston and a second end secured to said umbilical connector;

d. a power cartridge for generating a source of gas and for directing gas in said first inlet port to retract said inner cylinder for alignment of said second inlet port with said first inlet port whereby gas is directed against said piston for movement of said first object from said second object; and, shock absorbing means carried in the base of said outer cylinder.

4,037,822

SCISSORS JACK

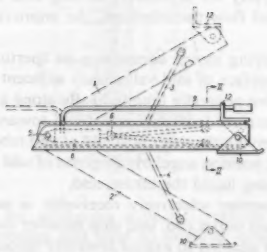
Giovanni Barcella, Zurich, Switzerland, assignor to AB Nike Hydraulik, Eskilstuna, Sweden

Filed Apr. 28, 1975, Ser. No. 572,498

Claims priority, application Sweden, May 6, 1974, 7406043

Int. Cl.[2] B66F *3/24*

U.S. Cl. 254—124 **3 Claims**



1. A scissors jack for lifting motor vehicles and the like, comprising a pair of first elongated substantially coextensive links disposed in a common plane, corresponding first ends of said pair of first links being pivotally connected to one another at a first pivot point whereby the other ends of said first links

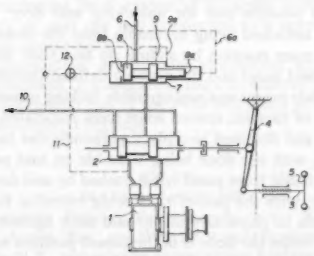
may be disposed closely adjacent to one another and may be selectively displaced relative to one another in said plane about said first pivot point, first engaging means adjacent the other end of one of said first links adapted to engage a ground surface, second engaging means adjacent the other end of the other of said first links adapted to engage a vehicle to be lifted, each of said first links being channel-shaped in cross section with said channel shapes being disposed in opposing relation to one another whereby, when said other ends of said first links are disposed closely adjacent to one another, said channel-shaped first links define an elongated cavity therebetween extending from said first pivot point to said other ends of said first links, a pair of elongated second links diposed in said common plane between said first links, one end of each of said second links being pivotally and inseparably connected to said first links respectively at predetermined fixed locations adjacent said other ends of said first links, the other ends of said second links being pivotally connected to one another at a second pivot point located in said common plane, said second links being shorter in length than said first links and extending from said other ends of said first links toward said first pivot point whereby said second pivot point is located in said elongated cavity at a position between said first pivot point and the pivotally interconnected ends of said first and second links, a hydraulic cylinder located entirely within said elongated cavity between said first and second pivot points, said channel-shaped first links having differing widths whereby one of said channel-shaped first links nests within the other of said channel-shaped first links when said other ends of said first links are in close proximity to one another to completely enclose and protect said second links and said hydraulic cylinder, and control means for applying fluid pressure to said cylinder to urge said second pivot point away from said first pivot point thereby to cause said second links to move the other ends of said first links and the engaging means thereon away from one another, said control means including means for selectively relieving said applied fluid pressure to cause said other ends of said first links to move toward and into close proximity to one another in response to enternal forces applied between said first and second engaging means, and said control means further including an elongated, manually operable lever disposed closely adjacent to and substantially coextensive with one of said elongated first links.

4,037,823

STEAM-DRIVEN TOW LINE WINCH

Hans Thaeter, Depkenstr. No. 2, 28 Bremen, and Anton Broehl, Postfach 84, 5474 Brohl-Lutzing No. 1, both of Germany

Filed Feb. 10, 1975, Ser. No. 548,742
Claims priority, application Germany, Feb. 13, 1974, 2406718
Int. Cl.² B66D *1/10*; F15B *11/10*
U.S. Cl. 254—172 **6 Claims**



1. In a winch system of the type including a tow line winch actuated by a steam-driven motor, a live steam line for supplying steam for operating the motor, an exhaust line, and a hunting valve for controlling the direction of steam flow from the live steam line through the motor to the exhaust line and thereby controlling the direction of operation of the winch, the improvement comprising:

a pilot operated pressure control valve having a pilot port and connected between the live steam line and the inlet port of the hunting valve;

a pilot line connecting the working pressure of the steam-driven motor to the pilot port of the pressure control valve and thereby actuating the pressure control valve toward a first position;

a three-way cock in said pilot line having one position for connecting the working pressure of the motor to the pilot port and another position for connecting the working pressure of the motor to said exhaust line whereby the pressure control valve is put out of operation; and

means for applying a predetermined bias to the pressure control valve and thereby actuating the pressure control valve toward a second position;

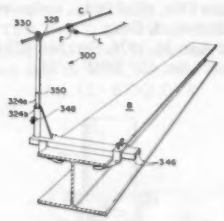
so that the flow of steam from the live steam line through the pressure control valve to the hunting valve depends upon the ratio between the working pressure of the steam-driven tow line winch and the predetermined bias.

4,037,824

SAFETY POST

Gerald T. Whitmer, Rte. 1, Box 33, Shenandoah Junction, W. Va. 25442

Filed Apr. 15, 1976, Ser. No. 677,140
Int. Cl.² B21F *27/00*
U.S. Cl. 256—53 **10 Claims**



1. A post for detachable affixation on flanged beams and the like to support a workers' safety-line-securing cable, comprising: a horizontal leg, a vertical leg, means for joining all said legs, means for clamping the horizontal leg to a said flanged beam, and the vertical leg having fixed thereto means including inwardly-turned overlapping horn structure having spacing for detachably engaging an intermediate portion of a said cable upon rotation thereof relative to a said cable, said spacing being proportioned for permitting a said workers' safety line on a said cable to be rotated in said spacing and passed along a said cable for passing a said post.

4,037,825

LOOP REACTOR FOR CHEMICAL PROCESSES

Herwig Burgert, 2, Helgenstock, Giessen, Germany (6300)

Filed Apr. 12, 1976, Ser. No. 676,322
Claims priority, application Germany, Apr. 14, 1975, 2516284
Int. Cl.² B01F *13/02*
U.S. Cl. 259—4 R **3 Claims**

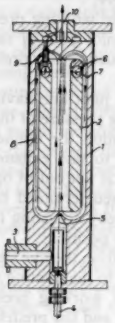
1. A loop reactor for chemical processes, comprising a reactor housing including inlet means at one end and outlet means at the opposite end of said housing;

pipes connected to said inlet means for supplying the reactants to be processed to the reactor;

a guide tube in said reactor housing defining a mixing chamber between said guide tube and the inner wall of said reactor housing;

means for inducing a circulation of said reactants through and around said guide tube;

annular means connected to said guide tube end adjacent said outlet means defining an annular space at one end of said guide tube, said annular space being connected to said mixing



chamber by openings through which said reactants enter into said annular space; and

escape pipes connected to said annular space for conducting said reactants to said reactor outlet.

4,037,826

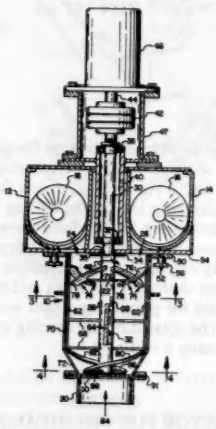
MIXING APPARATUS HAVING PLURALITY OF DIFFERENT BLADES WITH MULTIPLE FUNCTIONS

Gary L. Hulslander; Gary E. Mills, both of Portland, and David L. Harris, Oregon City, all of Oreg., assignors to Dependable-Fordath, Inc., Sherwood, Oreg.

Filed Apr. 26, 1976, Ser. No. 679,915

Int. Cl.[2] B01F *7/16*

U.S. Cl. 259—8 **16 Claims**



1. Mixer apparatus comprising:

mixing chamber means having a discharge opening at its lower end;

feeder means for introducing the materials to be mixed into the upper end of said chamber;

a rotatable shaft extending centrally through said chamber;

means for rotating said shaft; and

a plurality of blades fixed to said shaft within said chamber including convoluted mixing and impelling blades which spiral downward and inward to cause the spacing between said mixing blades and said shaft to decrease with distance along said shaft so that said mixing blades mix said materials and impel the mixed materials downward through said discharge opening when said shaft is rotated, and including longitudinal mixer blades fixed to said shaft above said convoluted mixing blades.

4,037,827

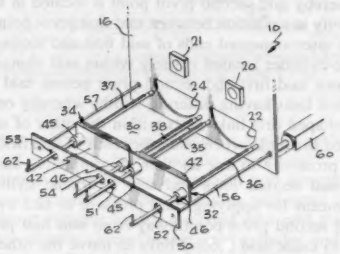
FOOD PRODUCT MIXER WITH AN IMPROVED DOOR MECHANISM

Alan L. Davison, La Mirada, Calif., assignor to F.P.E.C. Corporation, Maywood, Calif.

Filed Dec. 15, 1975, Ser. No. 640,729

Int. Cl.[2] B01F *5/00, 7/00, 15/02;* **B65D** *5/72*

U.S. Cl. 259—37 **13 Claims**



1. For use with a food product mixer of the type defining a mixer enclosure with mixing means therein for mixing the food product in said enclosure, the enclosure having a substantially vertical front panel with *n* door openings defined therein through which food product is dischargeable, *n* being an integer, a door mechanism comprising:

a separate slideable door associated with each opening;

separate slide means associated with each door and extending in a direction perpendicular to said front panel for supporting the door thereon, with said door being slideable on said slide means toward and away from said front panel;

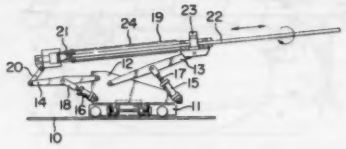
actuatable door pushing means for urging each door to slide on said slide means toward said front panel until said door is in a closed position in which the door enclosed its associated opening; and

separate operable locking means associated with each door for selectively locking each door when the latter is in the closed position and for unlocking said door, said door when unlocked being moveable from the closed position to an open position by sliding on said slide means away from said panel and the opening defined therein, wherein said slide means and said operable locking means comprise a pair of parallel, spaced apart rods, associated with each door, and disposed in a plane perpendicular to said front panel, with the door being slideable on said pair of rods toward said front panel when pushed by said door pushing means, with the pair of rods being rotatable to a locking position to physically clamp said door against said front panel when the door is in the closed position and thereby locks it to prevent it from sliding back on said rods away from said front panel, said rods being rotatable to an unlocked position in which said door is free to slide on said rods away from said front panel and the opening defined therein, thereby moving the door from its closed position to an open position.

4,037,828
AUTOMATIC TAPPING MACHINE

Takashi Terada, Kurobe; Isamu Amemiya, Uozu; Shinsaku Kubota, Uozu, and Koji Asada, Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 1, 1976, Ser. No. 701,876
Claims priority, application Japan, Oct. 4, 1975, 50-119368; Oct. 9, 1975, 50-122106; May 19, 1976, 51-56641
Int. Cl.² C21B 7/12
U.S. Cl. 266—271 **13 Claims**

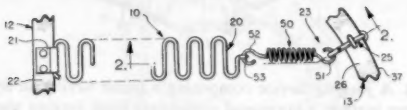


1. An automatic tapping machine for a tapping operation comprising a movable truck, a lower frame rotatably mounted on said truck, an upper frame arranged always in parallel with said lower frame, pressure actuatable means for moving said upper frame towards and away from said lower frame, a jig supporting mechanism adapted to hold a jig for use in the tapping operation, and a means for supporting said jig supporting mechanism above said frame and for actuating said jig supporting mechanism as required in the tapping operation, said jig holdable in said jig supporting mechanism having a diameter ranging from 40 to 100 mm.

4,037,829
SPRING CONSTRUCTION

Lawton H. Crosby, and John L. Crosby, both of 403 Center, Lake Bluff, Ill. 60044

Continuation-in-part of Ser. No. 466,383, May 2, 1974. This application Mar. 5, 1976, Ser. No. 664,384
Int. Cl.² F16F 3/00
U.S. Cl. 267—110 **8 Claims**



1. A rail attachment assembly comprising:

a. a curved frame rail having a back surface, a top surface, and a front surface, and

b. an anchor pin including an anchor leg seated against said back surface of said rail, a horizontal attachment extending from said anchor leg across the width of said rail, and an attachment hook extending inwardly from said front surface of said rail and connected to a normally arced sinuous spring band,

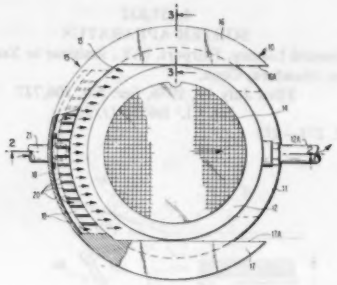
c. the longitudinal axis of said attachment leg extending perpendicular to a tangent to the curvature of the rail and the longitudinal axis of the band extending at an angle to said attachment leg axis.

4,037,830
WAFER HANDLER

Henry Benjamin Poluzzi, Poughkeepsie, N.Y.; Anthony M. Roberti, Austin, Tex., and Wilfried Robert Romich, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,541
Int. Cl.² B25B 11/00
U.S. Cl. 269—21 **9 Claims**

1. A semiconductor wafer chuck for carrying thin, substantially planar semiconductor workpieces comprising: a substantially planar surface having a workpiece receiving area thereon comprising a vacuum platen for attachment of a workpiece thereto; means defining a plurality of channels adjacent one edge of said planar surface and superimposed thereof; a conduit in fluid communication with said channels, and a foraminous

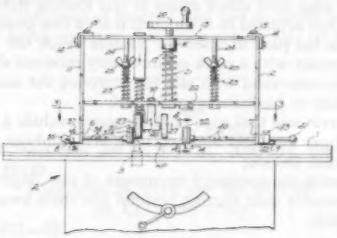


diffuser element in said conduit to equalize the pressure of fluid entering said channels; a source of at least Class 100 gaseous media connected to said conduit for supplying said channels with said gaseous media, whereby gaseous media emanating from said channels flows across the work area to create a laminar flow and a surface attachment effect of the gaseous media over said work area.

4,037,831
CUTTER HOLD DOWN APPARATUS

Harold O. Johnson, 1163 D St., Springfield, Oreg. 97477

Filed July 19, 1976, Ser. No. 706,538
Int. Cl.² B23Q 3/18
U.S. Cl. 269—306 **6 Claims**



1. An apparatus for attachment to the table of a bench saw or the like for confining workpieces of different thicknesses for travel past a rotatable cutter, said apparatus comprising,

a framework for attachment to the saw table and including table mounted members and an arch extending therebetween,

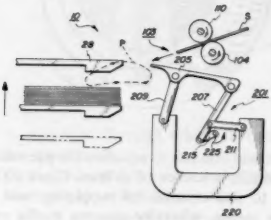
opposed fences inwardly of said table mounted members and laterally spaced from the cutter,

means adjustably coupling said fences to the table mounted members, and

a hold down assembly including hold down means for contact with the upper surface of the workpiece, a movable crossmember extending intermediate upright members of the framework arch and carrying said hold down means, crossmember supports on said arch, one of said crossmember supports adjustably mounted on said arch whereby the hold down means may be positioned to accomodate workpieces of different thicknesses, spring members carried by at least some of said crossmember supports and acting on the crossmember to downwardly

bias the hold down means carried thereby into workpiece contact to restrain same against upward displacement, adjustable means on some of said crossmember supports and positionable therealong to vary the rate of said spring members and hence the biasing force exerted thereby on said crossmember and on said hold down means.

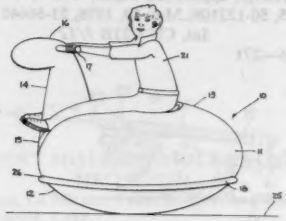
4,037,832
SORTER APPARATUS
John Howard Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 19, 1976, Ser. No. 706,727
Int. Cl.[2] B65H *31/26*
U.S. Cl. 271—173 **1 Claim**



1. An improved sorting apparatus comprising:
a frame;
a vertical array of close-spaced horizontally extending parallel bin members movably supported on said frame and adapted to move past said loading station for receiving a sheet,
means for moving said bin members relative to said loading station;
conveyor means at a loading station for directing sheets into a selected bin member as the bin members are moved relative thereto; and
trail edge hold down means at said loading station adapted when actuated to the moved from a first position outside the bin path to a second position inside the bin path in contact with a stack of previously received sheets of the bin coincident with said bin receiving the next incoming sheet to facilitate entry thereof;
wherein said trail edge hold apparatus include a plurality of finger members actuated by a drive linkage to move in crank fashion;
wherein the continued movement of said fingers returning towards their starting position lifts them away from said stack.

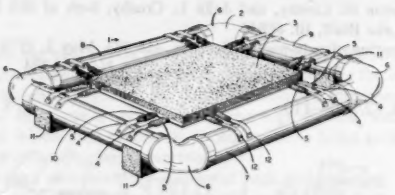
4,037,833
RIDING TOY FOR CHILDREN
Paul R. Anderson, 23701 Surf Cove, Laguna Niquel, Calif. 92677
Filed May 5, 1976, Ser. No. 683,408
Int. Cl.[2] A63G *19/02*
U.S. Cl. 272—52 **7 Claims**

1. A riding type toy for children, which comprises:
a rocking structure simulating an animal form having a generally ellipsoidal shaped body portion including a bottom surface adapted to engage a ground surface, a top surface and a neck portion extending upwardly adjacent the peripheral edge of the body portion having a head portion at the distal end thereof,
a pair of handhold bars having one of each extending outwardly of opposite sides of the head for a child to grip while seated on the top surface so as to provide the means for rocking and rotating said body slidably on the ground surface,
bumper means extending around the body portion and spaced from the ground surface adapted to engage rocking contact with said ground surface when so rocked and prevent said body from overturning beyond a safe angle from the verticle, the bumper means being adapted to exert a reactive force to return said body to an upright position,
a seat rest for the child to sit upon comprising a shallow



dish-like basin disposed proximate the center of said top surface, and
a leg rest comprising a pair of arcuate channels in said top surface extending from the seat rest downwardly on opposite sides of the neck portion for supporting the legs of said child.

4,037,834
JOGGING DEVICE
Arthur Q. Oaks, 432 Spring St., Cambridge Springs, Pa. 16403
Filed Aug. 20, 1975, Ser. No. 605,998
Int. Cl.[2] A63B *5/00*
U.S. Cl. 272—65 **6 Claims**

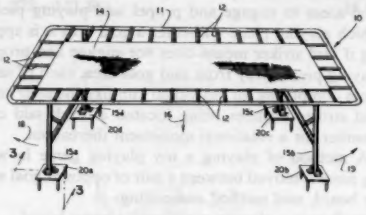


1. A jogging device comprising a frame having an arcuate upper surface, a horizontal completely rigid jogging platform freely suspended within and by same frame, means for yieldingly mounting the platform within the frame comprising a plurality of spring means, each of said spring means comprising in series combination a cantilever spring and a coil spring, said cantilever spring being attached to the arcuate upper surface of the frame and extending inwardly toward the platform, and said coil spring having one end thereof attached to the inward portion of the cantilever spring and the other end thereof attached to the platform.

4,037,835
STABILIZING MEANS FOR TRAMPOLINE
Roland W. Forsyth, Box 717, Decatur, Ga. 30032
Filed July 18, 1975, Ser. No. 597,015
Int. Cl.[2] A63B *5/18*
U.S. Cl. 272—65 **2 Claims**

1. A trampoline comprising a frame, a plurality of legs supporting said frame, a mat carried within said frame, and stablizing means comprising a plurality of stabilizing shoes, each including a supporting plate, retaining means fixed to said supporting plate for slidably receiving one of said plurality of legs and for preventing lateral motion of said leg in any direction with respect to said supporting plate, and anchoring means fixed to said supporting plate and slidably insertable into a supporting surface for preventing lateral motion of said sup-

porting plate with respect to any of a plurality of locations wherein said stabilizing shoe may be inserted, each of said plurality of legs having a foot at the lower end thereof, said retaining means comprising a first pair of substantially parallel



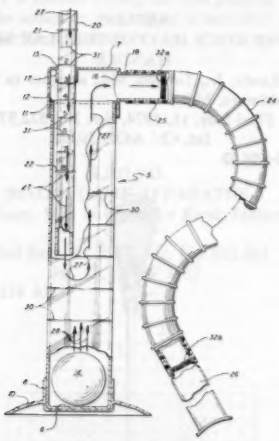
stops engaging opposite sides of said foot and a second pair of substantially parallel stops arranged substantially perpendicular to said first pair of stops, and second pair of stops engaging opposite sides of said foot.

4,037,836

RESPIRATORY EXERCISER

George Puderbaugh, Manlius, and Stanley Erman, East Syracuse, both of N.Y., assignors to Diemolding Corporation, Canastota, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,221
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—99 4 Claims



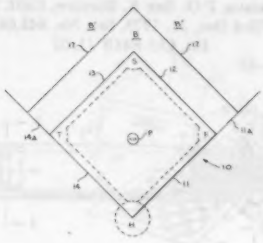
1. A respiratory exerciser comprising an upright tube closed at its lower end, a closure member for the upper end of the tube, a lightweight ball positioned in the tube, the closure member having a pair of apertures therethrough, an elongated open-ended tube slidably mounted in one of the apertures and projecting down into the upright tube, the axis of said open-ended tube being parallel to but offset from the vertical axis of said upright tube, and an inhalation tube one end of which is in communication with the other aperture whereby a user of the exerciser by inhaling air through the inhalation tube can cause the ball to rise in the upright tube, the degree of difficulty in raising the ball being controlled by moving the open-ended tube up or down in its aperture.

4,037,837

METHOD OF PLAYING BASEBALL

William Bauer, 212 Forester, El Campo, Tex. 77437

Filed Oct. 28, 1975, Ser. No. 626,256
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—25 6 Claims



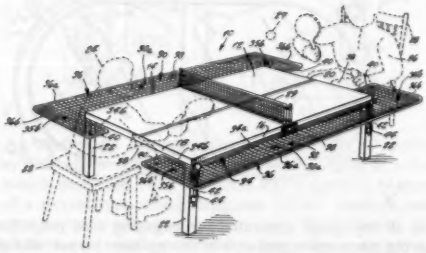
1. In a method of playing baseball comprising two opposing teams, having a plurality of players wherein one team is at bat and one team is on the field, said field having an infield, an outfield, foul lines, base lines, a home plate, a first base, a second base, a third base, and pitcher's mound wherein the improvement comprises having a plurality of members on each of said opposing teams, each of said teams having two forms, each of said forms having one or more members, assigning members of one form on both teams to a first designated area of said field, said first designated area being generally coextensive with said infield, designating a second area comprising less than 50% of the said field, said second designated area having at least a major part thereof disposedin said outfield, assigning a first form to use said first area of said field when the team to which that form belongs is on said field, and designating a second form of said team to said second area of said field, said second form being assigned to said second area of the field being restricted to said second area of the field for the purposes of playing the game of baseball, and said members of the first form not being restricted, but being able to play on the entire field.

4,037,838

MINI TENNIS TABLE

Walter W. McCune, 200 W. 97th St., Apt. 214, Bloomington, Minn. 55420

Filed Mar. 26, 1976, Ser. No. 670,995
Int. Cl.[2] A63B *67/04*
U.S. Cl. 273—30 3 Claims



1. In a tennis table having an elevated, generally rectangular horizontal playing surface defined by opposed relatively long side margins and opposed relatively short end margins, the improvement comprising: an elongated generally horizontal net means extending from said table including first portions directed along said side margins for catching a playing ball and preventing said ball from dropping to the ground; and second

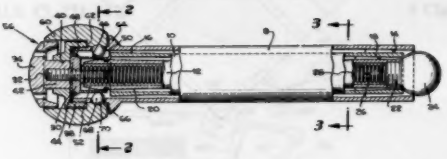
elongated portions of said net means directed along said end margins, said second portions defining gaps generally at the center of said end margins for enabling players to be positioned adjacent said end margins.

4,037,839

COLLAPSIBLE BATON

Norman C. Nelson, P.O. Box K, Barstow, Calif. 93211

Filed Dec. 31, 1975, Ser. No. 645,667
Int. Cl.[2] F41B *15/02*
U.S. Cl. 273—84 **13 Claims**



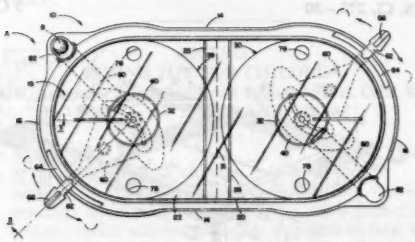
1. A police baton comprising,
at least a pair of telescoping tubes movable to extend and collapsed positions,
cooperating separably engageable stop portions adjacent the inner end of one tube and the outer end of the other tube to limit the extended movement of the tubes,
one of the tubes having a handle end,
spring means interposed between one of said handle end and its tube and the other tube and biasing said other tube to an extended position,
a catch device carried by said one of said handle and one of said tubes and releasably engaging said other tube for extension by said spring means,
and a safety lock associated with said catch device to releasably secure the catch device against release from said other tube.

4,037,840

TOY GAME DEVICE AND METHOD

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 12, 1976, Ser. No. 657,379
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—85 A **22 Claims**



1. A toy game apparatus for engaging and propelling a playing piece into a goal area of an opponent player, said game apparatus comprising:
a. a game playing board,
b. a retaining wall extending around said playing board for retaining a playing piece therein,
c. a pair of opposed recessed goal areas in said playing board, said game board being of complex curvature such that the goal areas are located at low points in said game board and that the portions of the game board surrounding said goal areas converge downwardly and inwardly toward said goal areas in such manner that the playing piece can move toward the goal areas through arcuate paths surrounding the goal areas and into the goal areas at any point on the entire periphery of the goal areas and from any direction around the goal areas,
d. and striker means operatively associated with each of said goal areas to engage and propel said playing piece, and which playing piece will enter a goal area it is approaching if said striker means does not engage and propel said playing piece away from said goal area, each of said goal areas comprising an individual cup-like member and each said striker member being located at each said cup-like member for a rotational movement thereabout.

20. A method of playing a toy playing game in which a playing piece is moved between a pair of opposed goal areas on a game board, said method comprising:
a. introducing a playing piece onto a game board,
b. permitting said playing piece to move toward one or another of a pair of opposed goal areas on said game board by force of gravity,
c. causing rotation of a striker member at either of said goal areas by manual actuation of an actuating member to engage and propel said playing piece,
d. said playing piece automatically entering said goal areas from any point around the entire periphery of each of the goal areas and from any direction to achieve a score if said striker member associated with each goal area does not engage and propel the playing piece away from said goal area, said game board comprising a conically-shaped wall surrounding each said goal area and merging into said goal area so that said playing piece automatically enters the goal area if the striker member associated therewith is not actuated.

4,037,841

LACROSSE STICK HAVING TUBULAR METALLIC HANDLE

Fielding H. Lewis, Jr., Towson, Md., assignor to W. T. Burnett & Co., Baltimore, Md.

Filed Nov. 11, 1974, Ser. No. 522,578
Int. Cl.[2] A63B *59/02*
U.S. Cl. 273—96 D **12 Claims**

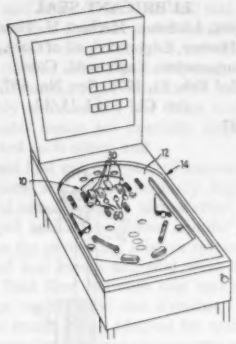
1. A lacrosse stick comprising a head; and a tubular metallic handle of elliptical cross-section, the major axis of said cross-section being normal to the general plane of said head, and the ratio of the length of the minor axis to the length of the major axis of said elliptical cross-section is within the range 0.8 to 0.93.

4,037,842

TARGET DEVICE FOR PINBALL GAMES

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed May 8, 1975, Ser. No. 575,975
Int. Cl.[2] A63B 71/00
U.S. Cl. 273—127 R 16 Claims



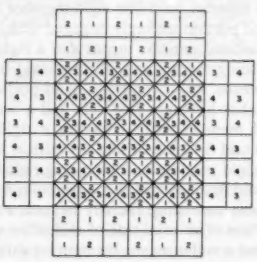
1. A target device for a pinball game, comprising:
a frame having means defining a playing surface over which pinballs are rollingly supportable;
an indicator member pivotally mounted on the frame for pivotal movement over the playing surface about an axis generally parallel and adjacent to the playing surface between first and second limit positions; and
actuating means operatively associated with said movable indicator and actuatable in response to engagement thereof by a pinball rolling on said playing surface for moving the indicator from either of said limit positions to the opposite limit position.

4,037,843

BOARD GAME APPARATUS

Alfred J. Hoffman, 1411 N. Kenmore Road, Indianapolis, Ind. 46219

Filed Sept. 25, 1975, Ser. No. 611,483
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—131 AB 1 Claim



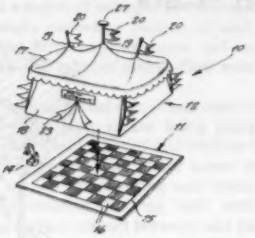
1. Board game apparatus comprising a game board having the configuration shown in FIG. 1 of the drawing and having on its surface the game pattern shown in said FIG. 1, the numerals in said figure representing four different colors on equivalent indicia, and four sets of game pieces, each set being of a different one of said colors or equivalent indicia.

4,037,844

CHILD'S TOY TENT CHESS BOARD

Jeanette LaMonica, and Diana LaMonica, both of 14710 Blyth St., Apt. 31, Panorama City, Calif. 91402

Filed Mar. 29, 1976, Ser. No. 671,387
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—136 K 4 Claims



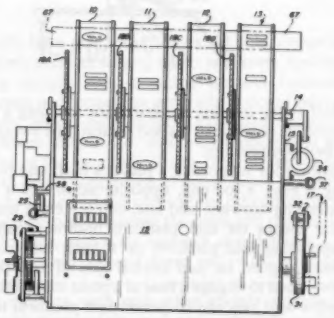
1. A child's toy tent chess board, comprising in combination, a chess board and a removable cover above said chess board, said cover being in the shape and ornamental appearance of a circus tent, said chess board and cover together forming a case enclosing playing pieces for said chess board, wherein said cover includes a circular disc upon an upper end of a center, upwardly extending pole for forming a handle for carrying said case in a hand.

4,037,845

AMUSEMENT APPARATUS

Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 558,340, March 14, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,905
Int. Cl.[2] A63F 5/04
U.S. Cl. 273—138 A 6 Claims



1. An amusement apparatus having a plurality of symbol display elements each having a plurality of symbols of a first type which designate "Win" symbols and a plurality of symbols of a second type which designate "Hold" symbols, said apparatus normally operative in a play cycle for displaying one symbol from each display element sequentially in a viewing area, said display elements adapted to be indexed at the end of a play cycle to display in said viewing area one symbol from each said display element to form a combination of said symbols which can have a predetermined score value, and control means associated with said display elements for automatically holding in said viewing area during the next succeeding play cycle a said "Win" symbol when at least one of the symbols simultaneously indexed with said "Win" symbol in said viewing area at the end of the first mentioned play cycle is a "Hold"

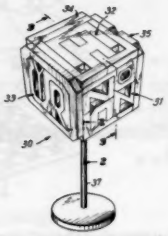
symbol; whereby a combination having increased score value can be built up stepwise in successive play cycles.

4,037,846

ALPHABET CUBE PUZZLE

Joan Javits Zeeman, R.F.D. Box 126, Waitsfield, Vt. 05673

Filed Jan. 27, 1976, Ser. No. 652,932
Int. Cl.[2] A63F 9/12; G09B 1/08, 1/10
U.S. Cl. 273—157 R **71 Claims**



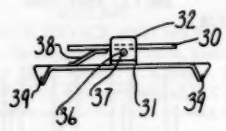
67. An alphabet puzzle comprising a reference member having a surface, a plurality of puzzle pieces shaped for mounting on said surface and means for releasably securing said puzzle pieces on said surface, said puzzle pieces being shaped substantially as shown in FIGS. **6, 7, 8, 9** and **10.**

4,037,847

GOLF SWING TRAINING APPARATUS

Walter R. Lorang, 2239 W. Maple Road, Walled Lake, Mich. 48088

Filed Feb. 6, 1976, Ser. No. 655,684
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—187 B **10 Claims**



6. Golf swing training apparatus for teaching a player how to control the position of his body during the swing of the club at the ball comprising:

a platform for supporting a player's foot; said platform having a heel, a toe end, opposite sides, and a central axis extending between said heel and toe ends; and

rocker means on said platform bi-directionally rockably supporting said platform on a base; said rocker means being aligned on said central axis of said platform and positioned to engage a base at a point substantially directly below said axis and to permit said platform to rock from side-to-side and engage a base laterally of said point;

said platform being bi-directionally rockable between a position inclined toward the target and a position inclined away from the target;

a player with his off-target foot on said platform with said platform inclined toward the target being advised of proper body positioning during his backswing by said platform not rocking and remaining inclined toward the target, and being advised of improper body positioning during his backswing by said platform rocking from an inclination toward the target to an inclination away from the target to indicate a body shift away from the target;

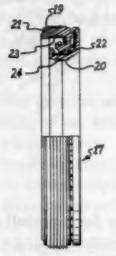
a player with his target foot on said platform with said platform inclined away from the target being advised of proper body positioning during his downswing by said platform rocking from an inclination away from the target to an inclination toward the target thereby indicating a shift of his body toward the target, and being advised of improper body positioning during his downswing by said platform not rocking from an inclination away from the target to an inclination toward the target thereby indicating that he did not shift his body toward the target.

4,037,848

LUBRICANT SEAL

David B. Prescott, Littleton; Herbert H. Thumm, Denver, and Raymond L. Horner, Englewood, all of Colo., assignors to The Mechanex Corporation, Englewood, Colo.

Filed Feb. 11, 1976, Ser. No. 657,094
Int. Cl.[2] F16J 15/32
U.S. Cl. 277—37 **13 Claims**



1. A seal for sealing between a bore and a shaft, said shaft being radially inwardly spaced from and coaxial with said bore and said bore and said shaft being subject to rotation relative to each other, said seal comprising;

a first substantially annular means having a first resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said bore for preventing fluid flow between said bore and said resilient elastomeric member, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said bore by manual effort for enabling said seal to be sealingly engaged with said bore without installation tools;

a second substantially annular means having a second resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said shaft for preventing fluid flow between said second resilient elastomeric member and said shaft, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said shaft by manual effort for enabling said seal to be sealingly engaged with said shaft without installation tools;

one of said first and second annular means further having a first rigid member, said first rigid member having a cylindrical band portion sealingly engaged with said one of said first and second annular means and a rigid wear surface radially facing toward said other of said first and second annular means, said cylindrical band portion of said first rigid member having a first side and a second side, said first rigid member further having a rigid side member affixed to said first end of said cylindrical band portion of said first rigid member and extending radially toward said other of said first and said second annular means, said rigid side member extending radially beyond a continuous annular portion of an axial side of said other of said first and said second annular means for limiting axial movement of said first and said second annular means relative to each other in a first axial direction;

the other of said first and said second means further having a second rigid member for supporting said resilient elastomeric member of said other of said first and second annular means;

said one of said first and said second annular means further

having an assembly maintenance rim disposed adjacent said second side of said cylindrical band portion of said first rigid member, said assembly maintenance rim radially extending beyond said wear surface of said cylindrical band portion of said first rigid member toward said other of said first and said second annular means, said assembly maintenance rim having a terminal radially facing portion having a spaced relationship relative to said second rigid member of said other of said first and said second annular means to provide a continuous substantially annular space between said second rigid member and said terminal radially facing portion of said assembly maintenance rim for enabling said second rigid member to move axially past said assembly maintenance rim when said first and said second annular means are coaxially aligned and forced axially toward each other; and

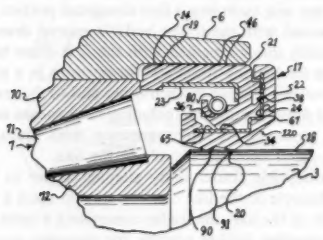
the other of said first and said second annular means further having resilient seal means sealingly engaged with said other of said annular means and adapted for being sealingly engaged with a continuous annular portion of said wear surface for permitting relative rotational movement between said seal means and said wear surface and for preventing fluid flow between said seal means and said wear surface under static and dynamic conditions, said resilient seal means being adapted for resiliently deforming as it is forced axially into engagement with said assembly maintenance rim as said first and said second annular means are coaxially aligned with said seal means adjacent said assembly maintenance rim and forced axially toward each other whereby said seal means resiliently deforms to slide over said terminal radially facing portion of said assembly maintenance rim and upon being forced axially past said assembly maintenance rim said seal means resiliently returns toward its original shape for sealingly engaging said wear surface and for limiting axial movement of said first and said second annular means in a second axial direction, said second axial direction being opposite to said first axial direction, for maintaining said seal as a preassembled unit.

4,037,849

LUBRICANT SEAL

Herbert H. Thumm, Denver, Colo., assignor to The Mechanex Corporation, Englewood, Colo.

Filed Feb. 11, 1976, Ser. No. 657,095
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—37 **3 Claims**



1. In a fluid seal for sealing between a bore and a shaft, said seal having a first resilient member for engaging said bore, a second resilient member for engaging said shaft and a rigid wear and support member interposed between and sealingly engaged with at least a continuous annular portion of each of said resilient members, said rigid member having a cylindrical portion affixed to one of said first and second resilient members and a radially extending portion, said radially extending portion having a substantially annular portion of an axial side surface disposed for engaging an axial side of said other of said resilient members for assuring proper alignment of said one of said resilient members and said rigid member relative to said other of said resilient members upon installation of said seal, the improvement comprising:

a continuous substantially annular stiffening groove comprising a continuous annular surface deformation formed in said substantially annular portion of said axial side surface of said radially extending portion of said rigid member disposed for engaging an axial side of said other of said resilient members, said stiffening groove being coaxial with and radially spaced from said cylindrical portion of said rigid member of aiding in preventing deformation of said radially extending portion of said rigid member due to axial force imposed upon said radially extending portion by said other of said resilient members; and

spacer means integral with said axial side of said other of said resilient members, said spacer means being interposed between said axial side of said other of said resilient members and said stiffening groove, said spacer means having a flat end portion aligned for engaging said continuous annular surface deformation forming said stiffening groove for reducing surface contact between said flat end of said spacer means and said rigid member.

4,037,850

SKI POLE HANDLE OR THE LIKE

Paul Haberlin, Bleicherweg 52, Zurich, Switzerland (8002)

Filed Oct. 20, 1975, Ser. No. 624,001
Claims priority, application Germany, Oct. 29, 1874, 2451381
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—11.37 H **8 Claims**

1. A handle for a pole, especially a ski pole, comprising an elongated body member having upper and lower ends and two substantially upright hand-engaging surfaces extending between said ends and formed on generally opposed sides of said body member, said upright surfaces extending approximately in the lengthwise direction of said body member and substantially parallel to the longitudinal axis thereof, one of said upright surfaces being configured to accomodate the distal end portions of the fingers of the user and the other upright surface being configured to accomodate the palm and the bases of the fingers of the user, said body member also defining a thumb resting surface formed on said upper end of the body member and on the same side of the body member as said other upright surface and merging with said other upright surface for accomodating the thumb of the user, and an upright wall formed on the same side of said body portion as said one upright surface and extending above said thumb resting surface to prevent the thumb from moving from said thumb resting surface towards said one upright surface.

4,037,851

STORE MERCHANDISING APPARATUS

Victor R. Romero, Sheridan Township, Calhoun County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 3, 1975, Ser. No. 628,198
Int. Cl.[2] B62B *3/02*
U.S. Cl. 280—79.3 **9 Claims**

1. A mobile merchanising cart, comprising:

base means;

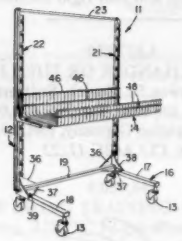
wheel means mounted on said base means for rollingly sup-

porting said base means on a support surface, such as a floor;

a pair of upright posts fixed to said base means and projecting vertically upwardly therefrom, said posts being substantially parallel and spaced a preselected distance apart;

each post having an elongated vertical mounting member extending longitudinally thereof and projecting frontwardly therefrom toward the front of said cart, said mounting member having a plurality of notches which are uniformly vertically spaced apart and are arranged in a vertical row which extends longitudinally of the post over a substantial portion of the length thereof, each notch being comprised of an upright slot having a closed bottom and a transversely extending slot at the upper end of said upright slot and extending frontwardly therefrom through the frontward edge of said mounting member, the notches in the mounting member of one of said posts each being horizontally aligned with a corresponding slot in the mounting member of the other of said posts;

at least one horizontally elongated shelf extending horizontally between and being removably supported in cantilevered fashion on said pair of posts, said shelf including a substantially vertically extending rear wall and a substantially horizontally extending bottom wall fixedly connected to said rear wall and projecting frontwardly therefrom;



a pair of parallel horizontally extending rods mounted on the rearward side of said rear wall and received within a pair of said notches in each post of said pair of posts, and each rod being sized to be movable through one of said transverse slots and into the corresponding said upright slot of the mounting member of its associated post, said pair of rods projecting rearwardly from the rearward side of said rear wall and being vertically spaced apart a preselected distance substantially corresponding to the vertical spacing between the bottoms of a pair of said upright slots and being received within a pair of said upright slots in the associated mounting member so that said shelf is removably supported on said posts in a cantilevered manner with the frontward edges of said mounting members projecting frontwardly of said rods.

4,037,852

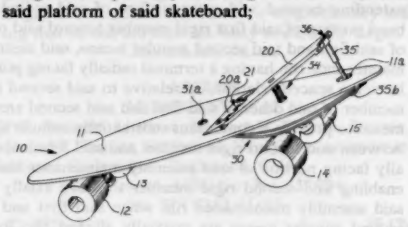
SKATEBOARD BRAKING METHOD AND APPARATUS

Arthur J. Bayer, 412 N. Curry, and Henry Schwarzer, 2815 Baker Drive, both of Carson City, Nev. 89701

Filed Mar. 17, 1976, Ser. No. 667,558
Int. Cl.² A63C *17/14*
U.S. Cl. 280—87.04 A **1 Claim**

1. The combination, with a skateboard comprising a platform with at least two pairs of wheels connected thereto on one side thereof, of:

1. Friction means pivotally supported by resilient members on the underside of said platform above one pair of wheels;
2. An activation lever attached to said friction means in such manner that said friction means is caused to come in contact with said wheels upon depression of said lever, and to be removed from contact upon elevation of said lever;
3. Hinge means pivotally attaching an end of said lever to said platform of said skateboard;



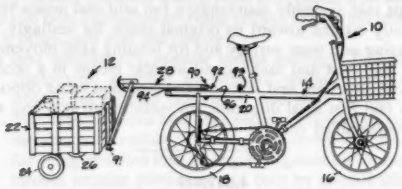
4. Spring means holding said lever normally at an angular relation to said platform, with the end of said lever not attached to the platform at a distance from the platform; and
5. Elongated rod means causing attachment of the lever means to the friction means.

4,037,853

DELIVERY BICYCLE-TRAILER

Carl K. Sparks, 227 Richardson Drive, Mill Valley, Calif. 94941

Filed June 4, 1976, Ser. No. 692,666
Int. Cl.² B62K *27/00*
U.S. Cl. 280—204 **12 Claims**



1. A trailer adapted for alternative use either to be towed behind a bicycle or the like or to be used as a hand truck, the trailer also being collapsible for storage upon the bicycle or the like, the trailer comprising a collapsible trailer body and a draw bar unit arranged at the forward end of the trailer body, the draw bar unit including a first elongated portion pivotably interconnected with the trailer body, a second draw bar portion pivotably interconnected with the first draw bar portion and means for locking the draw bar portions in a plurality of angled positions relative to each other and to the trailer body, the second draw bar portion including hitch means at its unpivoted end arranged for interconnection with hitch receiving means mounted upon the bicycle or the like.

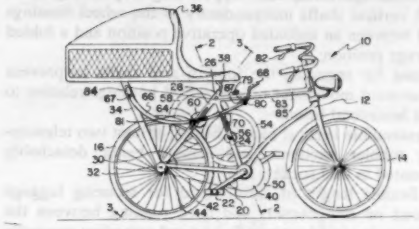
8. A collapsible trailer body adapted either to be towed behind a bicycle or the like or to be carried upon a portion of the bicycle or the like, the trailer comprising a central longitudinally extending bridge portion for spanning a supporting portion of the bicycle or the like, side portions pivotably connected with opposite sides of the bridge portion, each trailer side portion including a wheel bracket for supporting a rotatable wheel, a parallelogram linkage effectively interconnecting the bridge portion with each of the wheel brackets in order to maintain the wheels in vertical alignment both when the trailer is expanded for towing behind the bicycle or collapsed for mounting upon a supporting portion of the bicycle, and a trailer draw bar including a first elongated draw bar portion and a second elongated draw bar portion pivotably interconnected with the first draw bar portion, the second draw bar portion including hitch means at its pivoted end.

4,037,854

FLYWHEEL AIDED BICYCLE

Eugene Large, 25-64 83rd St., Jackson Heights, N.Y. 11370

Filed Oct. 15, 1975, Ser. No. 622,425
Int. Cl.[2] B62M 1/10
U.S. Cl. 280—217 1 Claim



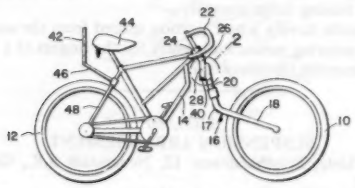
1. A pedal propelled vehicle comprising a frame in which are journalled a tractive wheel and a pedal carrying shaft, first transmission means drivingly coupling said pedal carrying shaft to said tractive wheel, flywheel means mounted coaxial and rotatable with respect to said shaft, second transmission means carried by said frame for drivingly interconnecting said tractive wheel to said flywheel, said second transmission means including a slip clutch means, an elongated slot means in said frame directed radially from said tractive wheel, said slip clutch means comprising a clutch wheel forming a part of said second transmission means which is carried rotatably on an axle passing through said slot means, said clutch wheel being dimensioned to engage the circumference of said tractive wheel when said axle is positioned at a particular location along said slot means, an elongated lever pivotaly mounted at one end to said frame; said lever being rotatably secured to said axle at an intermediate position along the length of said lever for selectively positioning said axle along said slot means, spring means acting between said lever and said frame for urging said clutch wheel out of engagement with said tractive wheel; and a handgrip on the other end of said lever.

4,037,855

BICYCLE WITH SHOCK ABSORBING FRONT END

Melvin Smith, 1040 Oak, Apt. No. 4, San Francisco, Calif. 94117

Filed Aug. 20, 1975, Ser. No. 606,199
Int. Cl.[2] B62K 21/20
U.S. Cl. 280—276 3 Claims



1. A bicycle of the type comprising a frame and front and rear wheels rotatably mounted in said frame, said frame including handle bars and a fork assembly connected to said handle bars, said front wheel being rotatably mounted at an end of said fork assembly remote from said handle bars, said handle bars and fork assembly being pivotably mounted in said frame such that rotation of said handle bars with respect to the rest of said frame will rotate said fork assembly and front wheel with respect to said frame,

characterized in that said handle bars are connected to a front steering post having a substantially vertically-oriented cylinder at the lower end of said steering post, said cylinder forming a continuous downwardly extending portion of said front steering post,

said steering post and said cylinder being pivotable with said handle bars, said cylinder having a piston member slidably mounted in said cylinder and a pair of coil springs of substantially equal strength positioned in said cylinder above and below said piston member, respectively,

said cylinder having upper and lower end members to confine said springs in said cylinder and adjacent the upper and lower surfaces of said piston member, respectively,

said cylinder having a single vertically-oriented slot in a front side thereof, said piston member having a neck extension thereon extending from a front side of said piston and through said slot in said cylinder, an end of said neck extension remote from said piston being joined to an upper portion of said front fork assembly said neck extension and said slot being dimensioned to provide contact surfaces for the transmission of rotational forces imparted on said steering post and being transmitted by said slot to said neck extension for controlling the steering of said front fork assembly,

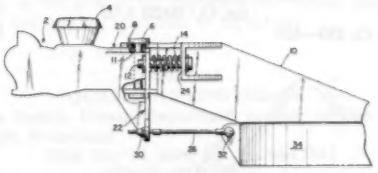
such that vertical shocks communicated to said front wheel and fork assembly due to road irregularities encountered by said bicycle will be springly cushioned by said pair of springs, yet said front wheel will be pivoted in response to rotation of said handle bars due to rotational force transmitted by said cylinder and the sides of said slot thereof against said piston extension.

4,037,856

LATERAL FORCE LIMITING COUPLER ASSEMBLY

Eric G. Medlin; Stephen A. Blair, and Richard H. Dennis, all of Tempe, Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

Filed May 26, 1976, Ser. No. 690,140
Int. Cl.[2] B60D 7/00
U.S. Cl. 280—446 B 14 Claims



1. A lateral force limiting coupler assembly for a towed vehicle, operable for self-contained actuation of a surge-brake mechanism on said towed vehicle, comprising in combination:

A. a coupler member adapted for engagement with a mating hitch assembly on a towing vehicle; and,

B. a yoke member comprising a movable actuator portion of said surge-brake mechanism, and a tongue member comprising a portion of the frame of said towed vehicle; and,

C. connecting means between said coupler member and said yoke member for allowing relative rotation in a lateral plane between said coupler member and said yoke member; and

D. dampening means between said coupler member and said yoke member for resisting said relative rotation; and

E. actuator means between said coupler member and said tongue member operable to actuate the wheel brakes of said towed vehicle in response to said relative rotation.

4,037,857
ELEVATOR TONGUE FOR FARM IMPLEMENTS

James C. Donahue, Durham, Kans., assignor to Donahue Corporation, Durham, Kans.

Filed Nov. 11, 1976, Ser. No. 740,823
Int. Cl.[2] B60D 1/00
U.S. Cl. 280—478 B 8 Claims

1. In combination with a vehicle bed having ground-engaging wheels adjacent its rearward end supporting said bed in spaced relation above the ground, and being connectable at its forward end to a towing vehicle at generally the same elevation above the ground, an elevator tongue for connecting said vehicle bed to said towing vehicle, said tongue comprising:

a. a horizontal, upwardly facing track affixed to said bed adjacent its forward end and extending parallel to the line of travel of said bed,

b. a beam normally parallel, generally coextensive with, and above said track, and having means at its rearward end supported on said track for movement therealong,

c. a ramp affixed to said beam thereabove and sloping downwardly and rearwardly,

d. supporting means rigidly associated with said track and movably engaging said ramp forwardly of the rearward end of said beam,

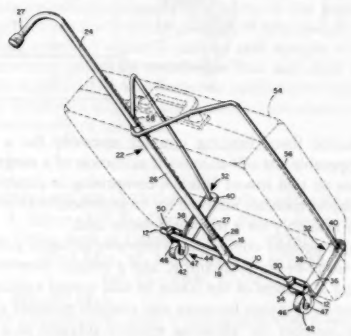
e. releasable beam locking means securing said beam against forward movement relative to said track, and

f. means for connecting the forward end of said beam to said towing vehicle for vertical pivotal movement relative thereto, whereby when said locking means is released and said towing vehicle is driven forwardly, said beam is moved forwardly relative to said track, and said supporting means, acting in cooperation with said track and said ramp, lower the forward end of said bed to rest on the ground.

4,037,858
PORTABLE LUGGAGE CARRIER

John F. Adams, 55 Lee Road, Chestnut Hill, Mass. 02167

Filed Oct. 20, 1975, Ser. No. 623,600
Int. Cl.[2] B62B 3/02
U.S. Cl. 280—652 8 Claims



1. A portable luggage carrier comprising:

a. a horizontal beam having a vertical aperture formed therein adjacent to each end thereof;

b. a vertical socket affixed to said horizontal beam at the approximate mid-point thereof, said socket having an upwardly-extending opening;

c. two individual horizontal support fingers each having a vertical aperture formed therein adjacent to one end thereof;

d. two individual wheel housings each having a wheel mounted for rotation therein, each said housing having a vertical shaft extending upwardly through one of said support finger apertures and through one of said horizontal beam apertures, said support fingers pivoting about said vertical shafts independently of the wheel housings and between an unfolded operative position and a folded storage position;

e. means for engaging the tops of said shafts to prevent downward movement of said wheel housings relative to said horizontal beam;

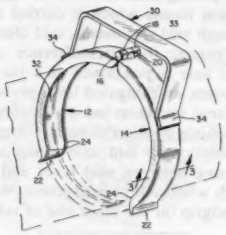
f. an extendible vertical handle having at least two telescoping tubular sections, said handle being detachably mounted in said socket; and

g. a flexible length of elastic cord for securing luggage placed on said carrier, said cord running between the other ends of said support fingers and extending upwardly over the luggage and then around said handle.

4,037,859
IRRIGATION PIPE JOINT LOCK

Lloyd W. Clements, 49 W. Lincoln Ave., C., Woodland, Calif. 95695

Filed July 19, 1976, Ser. No. 706,887
Int. Cl.[2] F16L 23/00, 37/12
U.S. Cl. 285—5 7 Claims



1. In an irrigation pipe joint clamp,

a pair or arcuate chennel-like arms having camming end portions,

securing means pivotally securing second hinging ends together,

and a generally U-shaped spring handle secured to the arms and biasing them inwardly,

the handle having a base portion spaced from the arms and the securing means sufficiently for the fingers of a user to be inserted therebetween.

4,037,860
SUSPENSION ARRANGEMENT

Horst Thiele, Friedhofstrasse 12, Neuenstadt a.K., Germany (7106)

Filed Sept. 11, 1975, Ser. No. 612,492
Int. Cl.[2] B60G 11/26
U.S. Cl. 280—709 5 Claims

1. A suspension arrangement for a vehicle having a plurality of axles and a frame supported by said axles comprising:

a. a plurality of suspension units respectively associated with said axles, each unit including

1. a cylinder member defining a first cavity,

2. a plunger member movable inward and outward of said cavity,

3. fastening means for fastening said members to said frame and to the associated axle respectively,

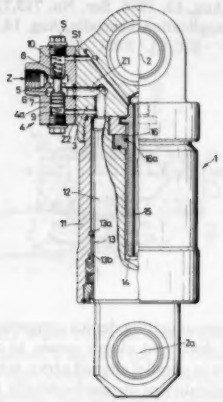
4. a cylinder element defining a second cavity and secured to one of said members for joint movement therewith, and

5. a plunger element moveable inward and outward of said second cavity and secured to the other one of said members for joint movement with the other member;

b. a pressure conduit;

c. a valve interposed between said conduit and said first cavity of each suspension unit;

d. a control conduit communicating with said second cavity of each suspension unit;



e. means for sealing said conduits from each other in all operative positions of said members, said elements, and said valves; and

f. a plurality of valve actuating means respectively associated with said units and responsive to a predetermined difference between respective fluid pressures in said control conduit and in the associated first cavity for closing the valve interposed between said associated first cavity and said pressure conduit.

4,037,861

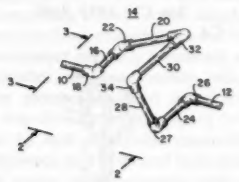
EXPANSION JOINT

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572

Filed Mar. 1, 1976, Ser. No. 662,595

Int. Cl.[2] F16L *27/00, 43/00*

U.S. Cl. 285—168 **1 Claim**



1. An expansion assembly for coupling first and second lengths of pipe, said expansion joint comprising:

a. a rotatable right angle joint coupling a first pipe section at right angles to said first length of pipe;

b. a second pipe section coupled at right angles by a rotatable right angle joint to said first pipe section and rotatable about the longitudinal axis of the first pipe section;

c. a rotatable right angle joint coupling a third pipe section at right angles to the second length of pipe;

d. a rotatable right angle joint coupling a fourth pipe section at right angles to said third pipe section and rotatable around the longitudinal axis of said third pipe section; and

e. a fifth pipe section intercoupling said second pipe section and said fourth pipe section by a rotatable right angle joint at each end of the fifth pipe section, such that the second and fourth pipe sections are rotatable around the longitudinal axis of the fifth pipe section; and wherein said joints includes a circumferential groove on the internal surface therein and grooves spaced circumferentially on the outer surface thereof positioned adjacent said internal groove, and wherein the pipe section being joined to said joint includes a cooresponding groove on the outer surface thereof confronting the internal groove of the joint, and further including a key member insertable through the outer groove of the joint into the channel formed by the confronting grooves of the joint and pipe section.

4,037,862

FLEXIBLE DUCTING JOINTS

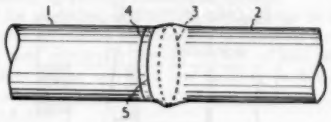
Peter Thorp, Hampton, and George William Bycroft, Doncaster, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 10, 1975, Ser. No. 621,373

Claims priority, application United Kingdom, Nov. 7, 1974, 48212/74

Int. Cl.[2] F16L *31/00*

U.S. Cl. 285—260 **5 Claims**



1. A joint between two lengths of a flexible ducting in which an end of a first one of the said lengths is provided with a single ring secured to its extreme end, and the end of a second one of the said lengths is provided with a pair of parallel rings one of which is secured to an extreme end of the length and the other of which is spaced from said one ring by a predetermined distance, one of the rings secured to the extreme ends of the lengths being elastically deformable and having a diameter greater than the diameter of the ducting and the other rings having diameters equivalent to the diameter of the ducting, the elastically deformable ring being inserted into the adjacent length of ducting to a position where the said single ring lies between the said pair of parallel rings, the elastically deformable ring thereby extending material of the adjacent length of ducting in the area of the elastically deformable ring to a greater size than the remainder of the ducting.

4,037,863

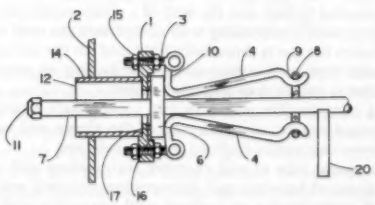
QUICK COUPLING DEVICE

Othello Kunzle, Gossau, Switzerland, assignor to Elex A.G., Zurich, Switzerland

Filed May 10, 1976, Ser. No. 684,754

Int. Cl.[2] F16L *39/00*

U.S. Cl. 285—320 **6 Claims**



1. A quick coupling device for connecting a feed member to a housing member comprising: clamping means including a pair of opposed spring clips with a groove at the outer extremity thereof movably connected to one of said members and

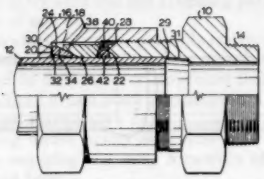
flange means fixedly connected to the other of said members to be engaged by said clamping means, said clamping means including a ring member engageable with said groove in nesting relation therein to hold said clamping means in clamped position against said flange means whereby said members are clamped against relative movement when said feed member and housing member are in assembled relationship, said other member including said flange means having stop means thereon, said ring member disposed between said stop means and said flange means, said stop means and said flange means being sized to retain said ring member therebetween.

4,037,864

PIPE COUPLING

Leslie T. Anderson; Arthur D. Thompson, and Iamo Kairbara, all of London, Canada, assignors to Emco Ltd., London, Canada

Continuation-in-part of Ser. No. 567,648, April 14, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,357
Int. Cl.² F16L *17/02*
U.S. Cl. 285—342 **3 Claims**



1. A compression joint for connection with a compressible pipe having an outside wall comprising;

a. a sleeve formed with external threads and having an end wall and having a bore with a central axis extending therethrough to receive the end of said compressible pipe;

b. a nut having a threaded interior axially extending side wall and a radial end wall extending normal to said axis and having an opening to admit the end of said compressible pipe in use;

c. said side wall of said nut, said radial end wall of said nut and said end wall of said sleeve combining with the outside wall of a said compressible pipe when inserted in said bore in use to define a compression chamber;

d. a split compression ring of non-deformable cross-section in said chamber and having a radial back wall extending normal to said axis and abutting said radial end wall of said nut when said nut is threadedly tightened on said sleeve, the ring having an outer wall tapering inwardly toward the pipe away from the ring's radial wall, the ring having an inner pipe-wall compressing wall tapering inwardly toward the pipe away from the ring's radial wall, the ring having a front wall between said outer wall and said inner pipe-wall compressing wall, and the pipe compressing wall terminating at its inner extent in a sharp edge at said front wall to form an inwardly directed protuberance adapted to lead into the wall of a compressible pipe as the pipe-wall compressing wall compresses the wall of a pipe when the nut is threadedly tightened on the sleeve in use, said pipe-wall compressing wall having an axial extent that is longer than its radial extent;

e. a compressible gasket in said compression chamber disposed against said end wall of the sleeve and having at least one axially inclined wedge wall; and

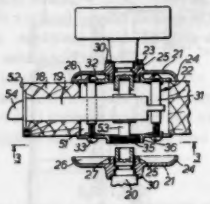
f. a spacer tube in said chamber surrounding said pipe and disposed between said compression ring and said gasket, the tube having an inclined wall contacting and complimentary with the tapered outer wall of the split ring and the tube having a wedge wall contacting said gasket, whereby to cause said gasket and said split compression ring to move radially inwardly to grip said compressible pipe in use due to wedging action as the distance between said end wall of said sleeve and said end wall of said nut is reduced by threadedly tightening said nut on said sleeve.

4,037,865

DOOR FURNITURE MOUNTING

John Laurence Hook, Doncaster, Australia, assignor to Gainsborough Hardware Industries, Pty., Ltd., Australia

Filed Aug. 12, 1976, Ser. No. 713,720
Claims priority, application Australia, Aug. 14, 1975, 2798/75
Int. Cl.² E05C *1/06*
U.S. Cl. 292—357 **12 Claims**



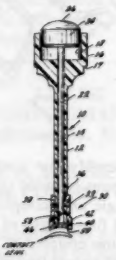
1. A door furniture mounting device comprising a pair of flat annular mounting discs and clamp means to draw the discs toward one another in parallel aligned array, wherein each disc is formed with a plurality of circumferentially spaced tongues which extend generally circumferentially of the disc but project to one side of the disc and which are spaced radially inwardly from the perimeter of the disc whereby in use of the mounting device the tongues may project laterally inwardly of said pair of mounting discs when the discs are held in said aligned array and can serve to locate the discs concentrically of an appropriately sized circular hole through the door by engaging the wall of the hole whereas in the event that the tongues cannot enter a hole in the door but engage the side faces of the door they can be deformed by their engagement with the door under the action of the clamp means to allow the discs to come flat against the door faces.

4,037,866

CONTACT LENS APPLICATOR

Edward E. Price, 421-B S. Marguerita, Alhambra, Calif. 91803

Filed July 26, 1976, Ser. No. 708,862
Int. Cl.² A61F *9/00*
U.S. Cl. 294—1 CA **6 Claims**



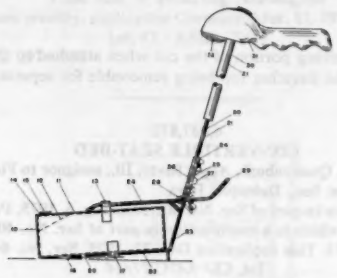
1. An applicator instrument for use with a contact lens comprising a flexible member having a portion configurated to be in contact with the convex surface of a contact lens for holding it by surface tension, means carrying the said member adpated to be positioned wwhereby a contact lens can be applied to a position against an eyeball, and means for deforming the flexible member whereby to release the contact lens leaving it against the eyeball.

4,037,867

SANITARY WASTE COLLECTOR

Joseph D. Fano, 85-17 150th St., Jamaica, N.Y. 11435, and Fu Hwa, 82-78 167th St., Jamaica, N.Y. 11432

Filed Dec. 10, 1975, Ser. No. 639,389
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R 10 Claims



1. In a sanitary waste collector comprising in combination a disposable container, a support for said container, and cooperating means on said container and said support for opening and closing said container and detachably connected said container with said support, the improvement comprising:

said disposable container including a bottom portion, a top closure portion swingably connected with said bottom portion;

said bottom portion including a base portion,

an upstanding rear portion fixed to said base portion, said swingable front portion including a front part complementary to said upstanding rear portion and a flap, said front part being swingably connected along an edge portion with said base portion for movement between a closed position and an open position positioned beneath said base portion;

said flap and said base portion including cooperating adhesive portions to hold said front part beneath said base portion in the open position of said container;

individual means connected with said base portion and said top closure portion detachably connecting said container with said support;

said support comprising a lower frame member and a vertical frame member fixed to each other and a moveable top cover frame member pivotally connected with said vertical frame member, said base portion being held to said lower frame member by said detachable connecting means, said top closure portions being held to said top cover frame by said detachable connecting means for movement between said open and said closed positions;

spring biasing means interconnecting said moveable top closure frame member and said vertical frame member urging said moveable frame member and said top closure portion into said closed position;

foot operated means connected with said moveable top closure frame member operable to overcome the force of said spring biasing means to move said moveable top closure frame and said top closure portions to said open position; and

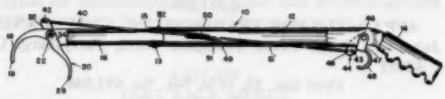
said front part and said base portion in said open position providing a free edge adapted to contact a ground surface, and said front part after removal from said support structure being swingable about said free edge to form a front upstanding wall with said base portion, and said top closure portion being adapted to enclose said front upstanding wall when said top closure portion is closed onto said bottom portion.

4,037,868

PICK UP APPARATUS

Robert M. Baker, R.F.D. No. 1, Morley, Mich. 49336

Filed Jan. 26, 1976, Ser. No. 652,297
Int. Cl.[2] B25J *1/00*
U.S. Cl. 294—19 R 6 Claims



1. A pickup apparatus comprising:

an elongated tubular shank flattened and curved at one end to define a curved first jaw member extending orthogonally to the axis of said shank and terminating at a linearly extending, continuous tip edge;

a second jaw member having a width substantially greater than said first jaw member, said second jaw member including an article engaging surface concavely curved about two, mutually perpendicular axes and terminating at a linearly extending, continuous tip edge;

means for mounting said second jaw member to said shank for relative motion with respect to said first jaw member with said concavely curved surface of said second jaw member facing said first jaw member such that the tip edges of said first and second jaw members align when closed; and

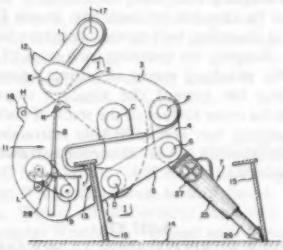
means coupled to said second jaw member for actuating said second jaw member for opening and closing said jaw members.

4,037,869

CLAMPING DEVICE FOR USE IN LIFTING SHIP'S HULL BLOCKS OR THE LIKE

Yoshimi Terada, Himeji, and Akira Fujii, Aioi, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kubushiki Kaisha, Ote, Japan

Filed Jan. 27, 1976, Ser. No. 652,739
Claims priority, application Japan, June 24, 1975, 50-87956[U]
Int. Cl.[2] B66C *1/10*
U.S. Cl. 294—104 1 Claim



1. A clamping device for use in lifting ship's hull blocks of the type having spaced-apart longitudinal members comprising a frame, a clamping lever pivotally mounted on the frame, a movable jaw pivoted to one end of said lever, said frame being provided with a fixed jaw arranged in opposed relationship to said movable jaw, said lever being pivotally movable to clamp a longitudinal member between the movable and fixed jaws, a first link having one and pivoted to said one end of the lever, a second link having one end pivoted to said frame, a pivotal connection between the other ends of the first and second links, an elongated support having one end pivotally connected with said other ends of the first and second links at the last named pivotal connection, and means for extending said sup-

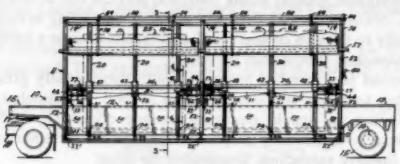
port to bring the other end thereof in firm engagement with an adjacent longitudinal member whereby the movable and fixed jaws firmly clamp the longitudinal member therebetween under the load force exerted to the clamping lever when a hull block is lifted and by the reaction force exerted to the movable jaw through said support.

4,037,870

APPARATUS FOR TRANSPORTING GLASS PANES

John L. O'Neal, 24982 Thompson Road, Perrysburg, Ohio 43551

Filed Jan. 23, 1976, Ser. No. 651,848
Int. Cl.[2] B60P *3/00*
U.S. Cl. 296—3 **3 Claims**



2. An improved structure for supporting stacks of one or more pieces of flat rigid sheet material on a semitrailer having a rigid main frame extending lengthwise of the semitrailer, said structure comprising a generally A-shaped frame having a plurality of pairs of opposed sloping side members extending downwardly to terminate below the level of said trailer main frame and a plurality of rigid internal webs joining said side members in each pair together at an intermediate position, said webs resting upon said main frame to support the entire structure on said semitrailer, means connecting said side members together at their top edges, said side members defining a sloped wall on each side of said structure, a plurality of load supporting girders, one girder extending outwardly from the lower end of each side member to provide a load supporting floor on each side of said structure, said structure supporting stacks of the flat material with edges of the material resting upon said floors and sides of the material resting against said sloped walls, and means for releasably clamping each stack for preventing movement of the material away from the sloped wall and for preventing edgewise movement of the material, said clamping means including a plurality of clamping bars, one clamping bar for each stack of the material and each clamping bar having a length greater than the maximum width of material stacks to be clamped by such bar, means for releasably attaching said clamping bars to said structure with at least a portion of a clamping bar spanning each stack of the material, said releasable attaching means including means for moving each clamping bar toward the adjacent sloped wall into contact with the outer surface of the stack of material spanned by such clamping bar, and releasable restraining means for preventing movement of said clamping bar away from such adjacent sloped wall.

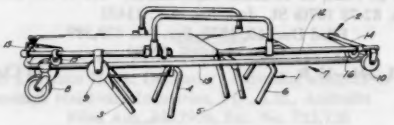
4,037,871

MULTIPLE PURPOSE AMBULANCE COT WITH REMOVABLE STRETCHER TOP

Elroy E. Bourgraf, Cincinnati, and Kenneth R. Self, Washington Court House, both of Ohio, assignors to Ferno-Washington, Inc., Wilmington, Ohio

Filed Apr. 23, 1976, Ser. No. 679,761
Int. Cl.[2] A61G *1/02*
U.S. Cl. 296—20 **7 Claims**

1. A multiple purpose portable ambulance cot comprising a carrier base and a detachable stretcher top, said carrier base having a supporting frame including a pair of side rails, said stretcher top having a stretcher frame including a pair of side rails, sets of rollers mounted on one of said frames for engagement with the side rails of the other frame, and releasable locking means for detachably securing said stretcher top to the supporting frame of said carrier base with said rollers in engagement with said rails, whereby said stretcher top forms the



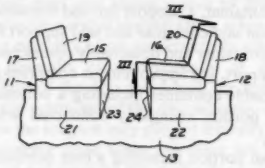
patient receiving portion of the cot when attached to the carrier base, the stretcher top being removable for separate use.

4,037,872

CONVERTIBLE SEAT-BED

Howard M. Quakenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa

Continuation-in-part of Ser. No. 602,203, Aug. 6, 1975, Pat. No. 3,913,152, which is a continuation-in-part of Ser. No. 402,860, Oct. 2, 1973. This application Dec. 22, 1975, Ser. No. 642,735
Int. Cl.[2] A47C *17/14*
U.S. Cl. 297—65 **9 Claims**



1. In a convertible seat-bed assembly, a base structure, a seat support structive for a generally rectangular seat, a back support structure for a generally rectangular back, means providing a first pivotal connection between a rearward portion of said seat support structure and a lower portion of said back support structure for relative pivotal movement of said structure about a first horizontal axis, a first arm means, means providing a second pivotal connection between an upper end of said first arm means and said seat and back support structures on a second horizontal axis with there being not more than a short distance between said first and second horizontal axes, means providing a pivotal connection between a lower end portion of said first arm means and said base structure for pivotal movement of said first arm means about a third horizontal axis, second arm means, means providing a connection between an upper portion of said second arm means and said back support structure to provide relative pivotal movement about a fourth horizontal axis, means providing a pivotal connection between a lower portion of said second arm means and said base structure on a fifth horizontal axis, all of said axes being parallel to each other, said first arm means pivotal between a first position in which said first and second horizontal axes are spaced a substantial distance behind a vertical plane through said third axis and a second postion in which said first and second horizontal axes are spaced a substantial horizontal distance forwardly from a vertical plane through said third horizontal axis, said second arm means being pivotal between a first position in which said fourth axis is behind and above said first and second axes and a second position in which said fourth axis is behind and below said first and second axes, said assembly being in a seating condition when said first and second arm means are in said first and second positions thereof and being in a bed condition when said first and second arm means are in said second positions thereof, said seat support structure being moved forwardly and said back support structure being pivotal about said first axis downwardly and backwardly relative to said seat support structure during operation

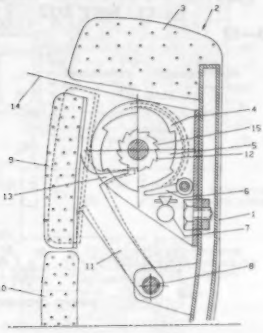
of said assembly from said seating condition to said bed condition.

4,037,873

CAR SEAT WITH SLACK ROLL-UP MECHANISM

Per Olof Weman, Norderstedt, Germany, assignor to N.V. Klippan S.A., Haasrode, Belgium

Filed Mar. 9, 1976, Ser. No. 665,350
Claims priority, application Germany, Mar. 11, 1975, 2510726
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—388 **5 Claims**



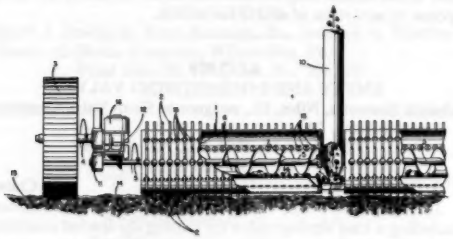
1. A car seat having a tension-free, roll-up belt collecting apparatus adapted to be actuated through a device arranged in the seat, so that further belt strap cannot be rolled up, said apparatus comprising a mechanically released locking means **(12, 13; 17, 18)** adapted to be actuated in response to the swiveling movement of the back rest **(2, 9)**, said locking means being disposed in a back rest **(2, 9)** which is moving at least partly.

4,037,874

APPARATUS FOR UNDERWATER RETRIEVAL, SELECTION AND CONCENTRATION OF MATERIAL FOR OCEAN MINING

Jan-Olaf Willums, Sandvika, Norway, assignor to Nor-Am Resources Technology Incorporated, Boston, Mass.

Filed Oct. 28, 1975, Ser. No. 626,307
Int. Cl.[2] E02F *7/00*
U.S. Cl. 299—8 **4 Claims**



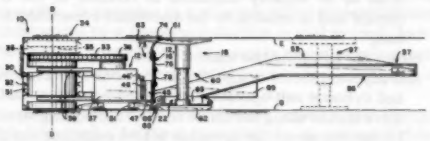
1. Apparatus for retrieval, selection and concentration of materials for mining from the ocean bottom and the like having, in combination, longitudinally rotatable drum means provided with digger means and corresponding adjacent opening means for receiving materials loosened by the digger means during rotation of the drum means over the ocean bottom, said digger means comprising a plurality of substantially longitudinally extending rows of forks spaced transversely along the drum means and said opening means comprising a corresponding plurality of adjacent rows of openings, the spacing between said forks determining the minimum size of material to be mined and the size of said openings determining the maximum size of the material to be mined; material-retrieving trough means extending longitudinally along the interior of the drum means and communicating with said opening means; drive means disposed within the trough means and rotatable with said drum means to concentrate and move the materials received in the trough means longitudinally inwardly to a pick-up region; and hydraulic conduit means disposed at said pick-up region for transporting said concentrated material upward from the bottom.

4,037,875

FULL FACE MINER

James Conley Justice, Beckley, W. Va., assignor to Coaltex, Inc., Beckley, W. Va.

Filed June 21, 1976, Ser. No. 698,123
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—31 **16 Claims**



1. A full face miner for mining coal in a seam, comprising:

a. a pair of cutting heads each rotatable about a vertical axis, the vertical axes being parallel to each other and longitudinally spaced from each other along the face of coal to be mined;

b. means for rotating each of said cutting heads about its vertical axis for effecting cutting, each head rotating toward the other head;

c. means mounting said cutting heads for reciprocal longitudinal movement toward and away from each other, to effect shearing, along the coal face;

d. means for moving said cutting heads on said mounting means in reciprocal longitudinal movement to effect shearing;

e. means for supporting the roof of the cut seam and for anchoring said mounting means in stationary position within the seam during reciprocal movement of said cutting heads with respect to said mounting means;

f. a pair of paddle-type conveyors associated with said mounting means, one for each cutting head, for conveying coal cut from said coal face by said cutting heads away from said coal face; and

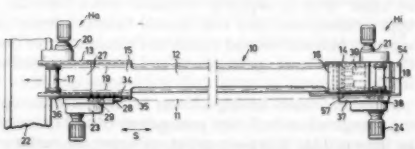
g. means for sumping said cutting heads.

4,037,876

TIGHTENING ARRANGEMENT FOR LONGWALL MINING MACHINE CABLE AND CONVEYOR

Werner Georg; Walter Heberling, both of Lunen, and Werner Langenberg, Werne, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed Dec. 1, 1975, Ser. No. 636,419
Claims priority, application Germany, Dec. 6, 1974, 2457790
Int. Cl.[2] E21C *29/16, 35/20*
U.S. Cl. 299—43 **22 Claims**



1. A mineral mining installation which comprises:

a scraper-chain conveyor with channel sections arranged end-to-end and a scraper-chain assembly movable along said channel sections;

drive stations at the ends of the conveyor for driving the scraper-chain assembly to effect transference of material along the channel sections of the conveyor and for driving a chain used to move a mining machine along the conveyor;

each drive station having a frame, drive means for driving the scraper-chain assembly and drive means for driving the chain;

each drive means for the chain comprising a drive motor and gearing unit supported by a housing in which is disposed a sprocket wheel drivably engaging with the chain and driven by said unit;

an intermediate connecting structure disposed between each frame and the adjacent endmost channel section of the conveyor and connected to the latter;

guide means to permit the housing at one of the drive stations to be slidably displaced in relation to the frame thereof and in relation to the associated connecting structure;

means for adjusting the tension in the drive chain;

said adjusting means comprising at least one hydraulic piston and cylinder unit operable to slide the housing at said one drive station along the frame and the connecting structure to thereby move the sprocket wheel engaging the chain and means at the other drive station for independently adjusting the tension in the scraper-chain assembly by displacing the frame and the scraper-chain assembly drive means of said other drive station.

4,037,877

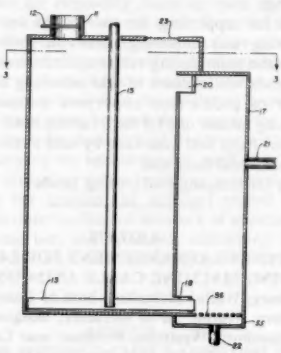
DOWN-LOADING DEVICE

Allen Foster, c/o Clark Associates, Bldg. 10, S. Tenth & Wright Ave., Richmond, Calif. 94804

Division of Ser. No. 550,443, Feb. 18, 1975, Pat. No. 3,942,840. This application Feb. 23, 1976, Ser. No. 660,635

Int. Cl.[2] B65G *53/36*

U.S. Cl. 302—53 **1 Claim**



1. A device for producing air-fluffed down comprising a first vessel and a second vessel with,

A. said first vessel having an upper opening to admit down, an upper filter to separate entrained down from air, an upper passageway into said second vessel, a lower passageway into said second vessel, and means to force down through said lower passageway and into said second vessel,

B. said second vessel having a lower air inlet, a lower opening connected to the lower passageway of said first vessel, an intermediate down-air outlet, an upper air outlet connected to the upper passageway in said first vessel, whereby said first vessel may contain a capacity of compact down and said second vessel may contain a predetermined amount of air-fluffed down,

C. said second vessel being cylindrical and of smaller diameter than said first vessel, and with said first and second vessels positioned so that the circular wall of said second vessel is partly within said first vessel.

4,037,878

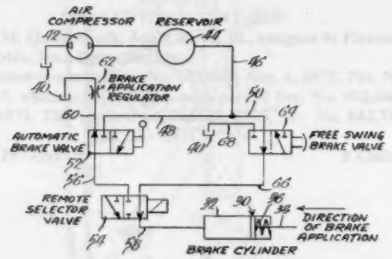
VEHICLE WITH DUAL BRAKING SYSTEMS

Ronald L. Zyduck, Mosinee, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed May 28, 1976, Ser. No. 690,888

Int. Cl.[2] B60T *7/12*

U.S. Cl. 303—13 **6 Claims**



1. In a vehicle having a turntable rotated about a fixed axis on a frame by drive means with normally actuated fluid released brake means between said frame and said turntable, a fluid circuit for supplying fluid under pressure to said brake means comprising a reservoir, a pressurized fluid source connected to said reservoir, first conduit means connecting said source to said brake means, said first conduit means having first valve means actuated in response to actuation of said drive means, said first valve means having a first position connecting said source to said brake means and a second position connecting said brake means to said reservoir, restrictor means between said first valve means and reservoir restricting fluid flow from said brake means to said reservoir, second conduit means connecting said source to said brake means, said second conduit means having second manually actuated valve means therein, and selector valve means in said first and second conduit means for selectively blocking flow in one conduit means while accommodating flow in the other conduit means so that said brake means may be released either manually or in response to actuation of said drive means.

4,037,879

EMPTY AND LOAD SENSING VALVE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed June 14, 1976, Ser. No. 696,059

Int. Cl.[2] B60T *8/18*

U.S. Cl. 303—23 R **11 Claims**

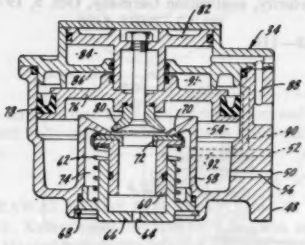
1. Empty-load valve means for a railroad air brake system including a load sensing valve for sensing the loaded condition of a railroad vehicle and a pressure control valve, two way air conduit means connecting said pressure control valve and load sensing valve,

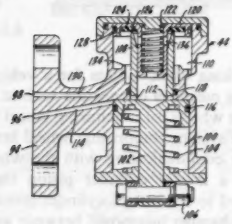
said pressure control valve including a housing having an inlet connected to the vehicle air supply, an outlet connected to the brake applying means and an exhaust port, a first chamber in said housing, a piston movable in said first chamber, said inlet and outlet being connected to said first chamber on opposite sides of said piston, means carried by said piston for controlling communication between said inlet and outlet,

a second chamber in said housing connected to said load sensing valve through said two-way air conduit means, a

portion of said piston being positioned to receive an air pressure created force from said second chamber whereby the position of said means for controlling communciation between said inlet and outlet is controlled by the pressure in said second chamber derived from said load sensing valve,

said load sensing valve including a housing having an inlet





and an outlet connected to said two-way air conduit means, separate independently movable telescopically mounted pistons in said housing, one of said independently movable pistons adapted to be placed in load sensing relation with a portion of a railroad vehicle, spaced coaxial springs urging said pistons in opposte directions, said pistons cooperating to control communication between said housing inlet and outlet.

4,037,880

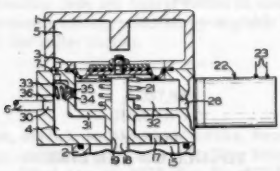
EMERGENCY BRAKE VALVE DEVICE FOR PROPOGATING AN EMERGENCY BRAKE APPLICATION

Robert J. Bridigum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 28, 1976, Ser. No. 700,399

Int. Cl.[2] B60T *17/04*

U.S. Cl. 303—82 **5 Claims**



1. An emergency vent valve device for a railway vehicle in a train having a brake pipe normally charged with fluid at a certain pressure and effective upon reduction of fluid pressure therein for initiating a brake application on the train, said emergency brake valve device comprising:

a. a casing having formed therein a first chamber connected to brake pipe pressure via a first choke, a second chamber connected to said brake pipe pressure via a second choke, and a third chamber open directly to the brake pipe and communicating with said first and second chambers via said first and second chokes, respectively, said brake pipe being communicable to atmosphere via said third chamber;

b. vent valve means operably interposed between said third chamber and atmosphere, said vent valve means being effective in a normally closed position for cutting off said third chamber and the brake pipe from atmosphere and being operable to an open position for opening said third chamber and, therefore, the brake pipe to atmosphere;

c. piston means operably disposed between and separating said first and second chambers and subjectable on opposite sides thereof to fluid pressure prevailing in said first and second chambers, respectively;

d. said piston means normally occupying a retracted position out of contact with said vent valve means in which said vent valve means assumes said closed position, and being operable, in response to a pressure differential established thereacross by a pressure reduction in said second chamber or said third chamber at a rate in excess of said preselected flow rate, to an extended position for operating said vent valve means to said open position; and

e. a one-way check valve interposed between said second chamber and said third chamber, the direction of flow being from said second chamber to said third chamber upon reduction of pressure in said third chamber to a degree less than that prevailing in said second chamber.

4,037,881

WHEEL SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

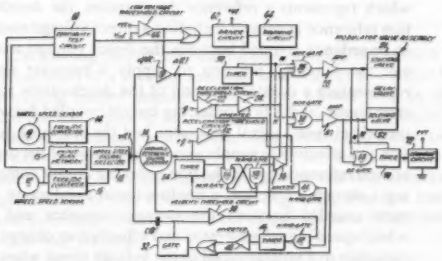
Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Continuation of Ser. No. 546,270, Feb. 3, 1975, Pat. No. 3,951,467, which is a division of Ser. No. 607,701, Aug. 25, 1975, Pat. No. 3,988,599. This application Apr. 15, 1976, Ser. No. 677,079

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.[2] B60T *8/02, 8/08*

U.S. Cl. 303—106 **5 Claims**



1. A wheel slip control system for a vehicle having at least one wheel with associated braking means, comprising:

a. first means operative to generate a variable-width deceleration pulse when the rate of change of rotational velocity of a selected wheel exceeds a deceleration threshold, said first means being further operative to generate a variable-width slip pulse when the change in rotational velocity of the selected wheel, measured from the value of said rotational velocity at the time said deceleration pulse is initiated, exceeds a reference increment of wheel speed which is variable in relation to both the velocity and the deceleration of the selected wheel during deceleration of the

selected wheel and in relation to acceleration during acceleration of the selected wheel;

b. second means operative to receive said deceleration pulse and said slip pulse, and further operative at least in response to said slip pulse to alter the braking force applied to at least said selected wheel; and

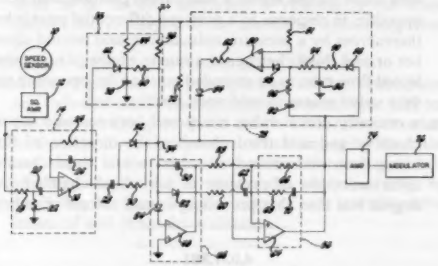
c. said variable reference increment of wheel speed comprising a fixed increment of wheel speed plus a variable increment of wheel speed.

4,037,882

ANTI-LOCK BRAKE CONTROL CIRCUIT

David W. Taylor, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1975, Ser. No. 633,674
Int. Cl.[2] B60T *8/10*
U.S. Cl. 303—107 **3 Claims**



1. An anti-lock system controller for a vehicle with braked wheels, comprising:

a wheel speed signal generator effective to supply a voltage signal representing wheel speed;

a summing junction;

a differentiator coupled between the wheel speed signal generator and the summing junction and effective to differentiate the voltage signal and supply an acceleration signal to the summing junction representing wheel acceleration and deceleration;

a deceleration reference generator effective to supply a deceleration reference signal to the summing junction which represents a reference deceleration, the deceleration reference generator including a direct voltage source, an impedance coupled between the direct voltage source and the summing junction to supply a constant signal representing a constant portion of the deceleration reference signal, and a first order lag circuit coupled between the wheel speed signal generator and the summing junction and effective to supply a variable portion of the deceleration reference signal, the first order lag circuit comprising a storage capacitor, a unidirectional conducting element coupled between the storage capacitor and the wheel speed signal generator and effective to charge the capacitor to a voltage equal to the voltage signal when the voltage charge on the capacitor is less than the voltage signal, and an impedance coupled between the capacitor and the summing junction and effective to discharge the capacitor into the summing junction at a controlled rate, the current through the impedance comprising the variable portion of the deceleration reference signal; and

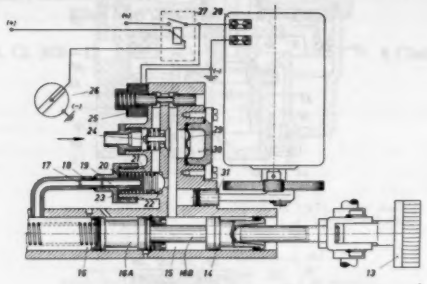
means effective in response to the acceleration signal and the deceleration reference signal by cyclically relieve and apply brake pressure when the acceleration signal and the deceleation reference signal attain predetermined relationships, whereby the variable portion of the deceleration reference signal provides adaptive control for road surfaces of varying coefficients of friction.

4,037,883

ANTI-LOCKING BRAKE SYSTEM

Werner Karl Heinz Fuchs, Sedlmayrstr. 14, 8 Munich 19, Germany

Continuation-in-part of Ser. No. 405,412, Oct. 11, 1973, abandoned, which is a continuation of Ser. No. 185,130, Sept. 30, 1971, abandoned. This application Sept. 17, 1975, Ser. No. 614,198
Claims priority, application Germany, Oct. 5, 1970, 2048802
Int. Cl.[2] B60T *8/06*
U.S. Cl. 303—116 **10 Claims**



1. An antilocking brake system for a vehicle with wheels having a sensing means in connection with at least one of the brakable vehicle wheels for monitoring wheel rotary deceleration, said brake system comprising: wheel brake cylinders, a master cylinder communicating with the wheel brake cylinders including a master cylinder piston therein, actuating means connected to the master cylinder piston for the actuation thereof, a chamber interposed between said master cylinder and said actuating means including an opposite piston in communication with the actuating means for reducing the braking force in the master cylinder when pressure within said chamber acts upon the opposite piston, pulsating means in communication with said chamber for producing pressure pulsations within the chamber, a solenoid valve connected to said sensing means for actuating the pulsating means, and further comprising:

a pressure regulating valve in communication with said chamber, an outlet and the master cylinder including a cylinder in communication with the master cylinder, a slidable regulating piston reciprocating in the cylinder, a check valve between the chamber and the outlet in order to pass fluid from said chamber to said outlet of the regulating valve, and a spring means mounted between said check valve and the regulating piston.

4,037,884

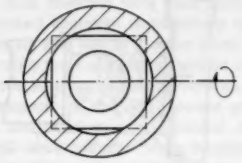
TOGGLE OR THE LIKE

Peter Bachinger, Bronnamberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,199
Claims priority, application Germany, Oct. 30, 1974, 2451658
Int. Cl.[2] F16C *7/00*
U.S. Cl. 308—2 R **3 Claims**

1. Apparatus including a toggle or the like, said apparatus comprising: a hollow cylinder; an approximately spherical body supported inside said cylinder in a manner to rotate about

an axis normal to that of said cylinder, the internal surface of said cylinder having at least one annular groove, and said body



having an annular disc fitting in said groove; and a stub shaft fixed to said body and thereby movable therewith.

4,037,885

WITHDRAWAL GUIDE FOR DRAWERS OR THE LIKE

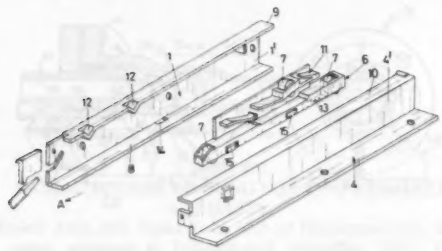
Erich Rock, Kuferstrasse 1085, A-6973 Hochst, and Bernhard Mages, Harte 10, A-6850 Dornbirn, both of Austria

Filed Feb. 23, 1976, Ser. No. 660,317

Claims priority, application Austria, Feb. 25, 1975, 1447/75; May 30, 1975, 4105/75; July 24, 1975, 5750/75

Int. Cl.² F16C *29/04*

U.S. Cl. 308—3.8 **10 Claims**



1. A withdrawal guide for a drawer and the like comprising: fixed support base means; one support rail on said fixed base means for each side of the drawer, one guide rail on the drawer, rollers for transmitting vertical forces occurring between said guide rail and said support rail, a roller carrier for supporting said rollers and comprising a mobile unit, at least one compensating roller in the mobile unit, said compensating roller having an axis of rotation normal to the axis of rotation of said rollers, a vertical track on said support rail said compensating roller running on said vertical track of the support rail and said guide rail respectively, said compensating roller being held only on its peripheral area without an axle being free to move in radial direction to a predetermined degree, peg means to secure the compensating roller to the roller carrier when the drawer guide rail is pulled out of the support rail, said peg means extending only ina lateral recess in said compensating roller, said compensating roller being snapable in and out of its position in the roller carrier.

4,037,886

BEARINGS

Karl Boden, Juelich, and Werner Geweke, Reutlingen, both of Germany, assignors to Padana AG, Zug, Switzerland

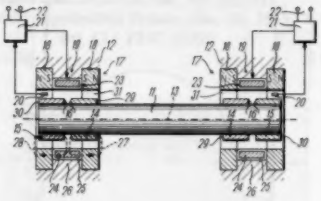
Filed Apr. 29, 1975, Ser. No. 572,668

Claims priority, application Germany, Apr. 30, 1974, 2420814

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **21 Claims**

1. In a magnetic bearing for supporting two members against movement in a direction; two ferromagnetic parts on one of said members, said ferromagnetic parts respectively defining two mutually facing shoulders, said shoulders being spaced by a non-ferromagnetic gap in said direction, and magnet means arranged on the other of said members, said magnet means and said ferromagnetic parts defining two flux paths which respectively pass through said two ferromagnetic parts at said shoulders in opposite directions to exert a stabilizing effect upon said



bearing in said direction, which direction is substantially parallel to said opposite flux path directions in said ferromagnetic parts, said magnetic field being substantially constant and exerting a destabilizing effect on said bearing in a direction transverse to said direction.

4,037,887

UNIVERSAL-JOINT ASSEMBLIES AND SELF-ALIGNING THRUST BEARINGS, ESPECIALLY FOR THE SHAFTS OF ROTATING MACHINES

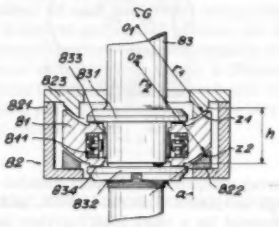
Roger Louis Elysee Germain, Maisons-Lafitte, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 10, 1976, Ser. No. 685,128

Claims priority, application France, May 14, 1975, 75.15575

Int. Cl.² F16C *23/00*

U.S. Cl. 308—72 **5 Claims**



1. A guiding unit for preventing axial translational motion of a rotor shaft of a rotating machine with respect to a stator by permitting limited angular displacement of said shaft in any axial plane comprising a housing, a bearing support articulated within said housing, said housing being within said stator, two partial spherical sliding zones on said support having different centers, a ring, a complementary surface on said ring cooperating with one of said zones and said ring being free in a transverse direction with respect to the axis of rotation of said rotor within said housing.

4,037,888

CONSTRUCTION OF SEPARATING SURFACES OF A SPLIT BEARING

Milorad Mirjanic, Fellbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

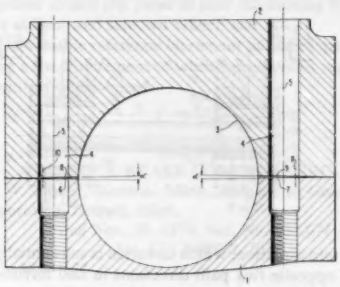
Filed Jan. 8, 1975, Ser. No. 539,427

Int. Cl.² F16C *19/04*

U.S. Cl. 308—74 **17 Claims**

1. A construction of the separating surfaces of a split bearing provided with bores for receiving tightening bolts and with center longitudinal axes of the bores of the bolts intersecting the separating surfaces laterally of the center of the separating

surfaces, as viewed in cross section, characterized in that two adjacent separating surfaces of different bearing parts are inclined to one another with non-tightened bolts in such a manner that they subtend, as viewed in cross-section, an angle



of the magnitude of less than 1°, and in that said angle opens in the direction toward that side of the center of the separating surfaces, on which are located the center longitudinal axes of the bores of the bolts.

4,037,889

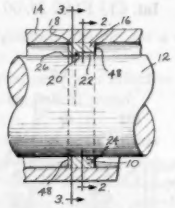
JOURNAL BEARING

James A. Piatt, 1337 Woodfield Ave., South Bend, Ind. 46615

Filed June 14, 1976, Ser. No. 696,038

Int. Cl.[2] F16C *1/24*

U.S. Cl. 308—121 **9 Claims**



1. A bearing comprising a support member having a bore therethrough to receive a rotatable shaft, said bore having a side wall formed by a shaft load carrying part and a shaft control part offset radially and longitudinally from said load carrying part by a shoulder, said load carrying part including segment means for bearing the load of said shaft, said control part including segment means separated from said load carrying part by said shoulder and located generally oppositely of the segment means of the load carrying part for restricting lateral movement of said shaft within said bore.

4,037,890

VERTICAL TYPE ANTIFRICTION BEARING DEVICE

Seiichi Kurita, Takahagi; Toru Nakayama, Hitachi; Kinpei Okano, Hitachi, and Seishi Watahiki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1975, Ser. No. 568,198

Claims priority, application Japan, Apr. 26, 1974, 49-46539

Int. Cl.[2] B61F *17/22*; F16C *1/24*

U.S. Cl. 308—187 **16 Claims**

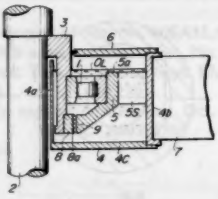
1. A vertical type antifrication bearing device comprising:

an antifriction bearing positioned between a vertical rotary member a stationary member;

an oil tub which houses said antifriction bearing and having lubricating oil filled therein;

pumping means for maintaining the level of said lubricating oil below said antifriction bearing during operation;

an oil feeding passage for feeding a desired amount of lubricating oil to said antifriction bearing from above, when the level of the lubricating oil is lowered below said antifriction bearing; and



an oil return passage for returning the level of the lubricating oil to its initial position which permits the immersion of said antifriction bearing in said lubricating oil, during the stoppage of operation.

4,037,891

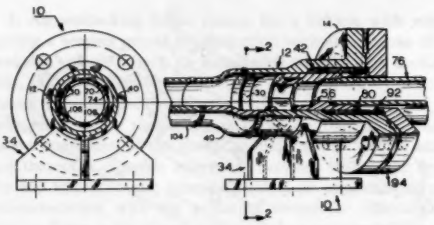
GLAND SEAL COMPRESSION

Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed July 1, 1976, Ser. No. 701,545

Int. Cl.[2] F16C *33/72*

U.S. Cl. 308—187.1 **22 Claims**



1. A calcuably controlled opposed conical wedging seal compression and anchorable gland seal complex for conveying pressurized liquid and gases consisting of substantially overlapping tubular members with an inner male fourth member axially slidable along and swivelable within other gland members about an axis common to other members in a sealed manner where an outer female first member has an upstream attachment end to subsequently retain the various members compressed, an inner axis based conical directional seal positioning bevelled section leading outward from an inner downstream male fourth member receiving chamber to an inner upstream second, third and fifth member receiving chamber where the second member is an annular seal ring element with opposed axis based conical bevels, complimentary with said directional seal positioning bevelled section of said female first member, leading inward in a manner to form opposed side shoulders at its inner cylindrical male fourth member receiving surface providing said seal element with a cross sectional shape of a substantially shouldered conical frustrum symmetric about a radial plane, where the third member is an annular travel gland which has a leading downstream axis based conical directional seal positioning bevelled end where said bevel is complimentary to the bevel on the seal element second member and leading from said third member's outer cylindrical surface inwardly upstream to its inner cylindical fourth member receiving chamber whereupon when the male fourth member after being received within the female first member's downstream receiving chamber, receives the seal element second member, receives the travel gland third member, followed by a fifth member which is a guidedly positioned compression spring where the second, third and fifth members are slidably received within the upstream receiving chamber of the female

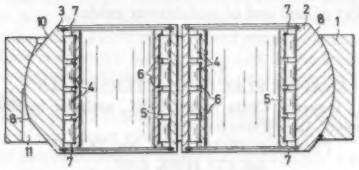
first member and compressingly retained therein by a retaining sixth member being firmly secured to the female first member's upstream attachment end in a manner where the configurations of the first and sixth members have lineal movement limiting abutments to contact abutment shoulders on the male fourth member to maintain said fourth member's seal receiving surface in contact with the seal element second member during subsequent fourth member lineal movements wherein said compressed retainment of the seal element second member where the first and thrid member's conical directional seal positioning bevels abut complimentary bevelled surfaces on the seal element second member compressingly deforming said seal element in a manner to effectively be sealed within said conical directional bevelled sections of the first and third members and for said seal element to be effectively sealed around the male fourth member permitting said fourth member to have lineal, rotary and torsional movements while effectively sealed to prevent the escapement of pressurized materials being conveyed within the gland complex where the continual seal confinement and deformation is accomplished by the constant rate compressive reacting force of the selected compressed spring fifth member applied in a non-crippling that assures a longer life expectancy and reliability of the seal element material and other gland members.

4,037,892

RADIAL ROLLER BEARING FOR TWO PARALLEL SHAFTS

Rudolf Jahn, and Arpad Toth, both of Herzogenaurach, Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Nov. 28, 1975, Ser. No. 635,794
Claims priority, application Germany, Jan. 24, 1975, 2502860
Int. Cl.² F16C *23/06, 35/04*
U.S. Cl. 308—194 **3 Claims**



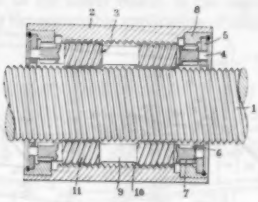
1. A radial bearing for two parallel shafts whose direction of radial load is inclined 60° to 75° to the outside toward a line intersecting the two shaft axes comprising a pair of races with a spherical outer contour adjustably mounted in a common bearing housing, the said races being flattened at their facing points with a gap between the races whereby the axes of the races are so close together that their distance is less than the diameter of a race, the recess of the housing receiving the races having an inside width of at least the axial length of the races, one of said races being provided at the side opposite the flattened portion with two plane or slightly curved surfaces inclined to each other and running from the end faces of the race and protruding into the area of its crowned surface and the said housing being a unitary element provided in the area of one recess at one end face with an inlet groove corresponding to the cross-sectional profile of said race.

4,037,893

ROLLING-CONTACT BEARINGS WITH THREADED OR GROOVED PLANET ROLLERS

Herve Perrin, Chambery, France, assignor to La Technique Integrale, Chambery, France

Filed Jan. 19, 1976, Ser. No. 650,141
Claims priority, application France, Jan. 21, 1975, 75.01813
Int. Cl.² F16C *13/00*
U.S. Cl. 308—205 **2 Claims**



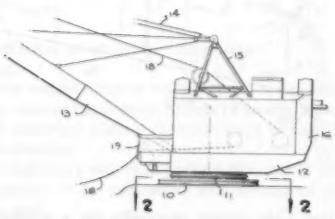
1. A rolling-contact bearing comprising
an inner central screw having an axis and an outer thread extending along its entire length, said thread formed with a predetermined pitch with respect to said axis;
an outer annular nut having internal threads extending along its inner annular surface;
a plurality of axially extending rollers spaced about the periphery of said inner screw and each providing a threaded interconnection between said inner screw and said outer nut;
each said roller having end sections threaded to mesh with said inner screw with the threads having a predetermined root diameter and the threads in each section formed with the same pitch that is oppositely directed with respect to said predetermined pitch;
said end sections of each said roller being connected together by a central unthreaded portion, the diameter of each said central portion being substantially equal to said root diameter and extending axially a distance equal to approximately the central third of each said roller; and
each said central portion connected to its respective said end sections by rounded fillets.

4,037,894

FRAME CONSTRUCTION FOR POWER SHOVELS AND THE LIKE

Edwin W. Sankey, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Filed Feb. 26, 1976, Ser. No. 661,818
Int. Cl.² F16C *19/04*
U.S. Cl. 308—227 **10 Claims**



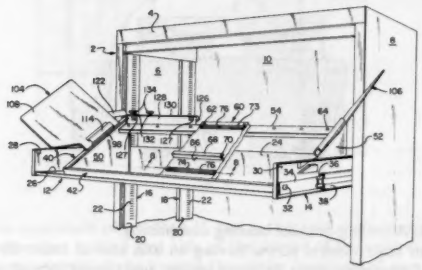
1. In a machine having an upper moveable frame, a support frame for supporting said upper moveable frame comprising a rigid grid structure, an upper plate disposed on and rigidly secured to said grid structure and a pad for supporting said upper moveable frame, said support pad being disposed unattached on said grid structure and rigidly attached to said upper plate.

4,037,895

DOCUMENT STORAGE SYSTEM

Norman Hedstrom, Worcester; David Wright, and Jerome O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Mar. 23, 1976, Ser. No. 669,672
Int. Cl.[2] A47B *41/06, 63/00*
U.S. Cl. 312—233 **8 Claims**



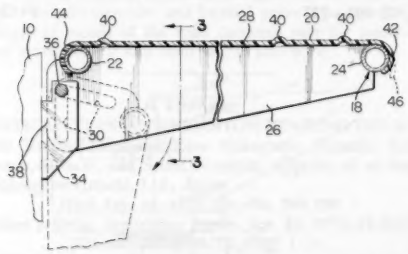
1. A filing cabinet containing at least one pull-out storage unit having opposite sides, means on said storage unit for supporting a plurality of books each including a binding portion, said books being supported in a reading position on said storage unit with said binding portions substantially aligned and facing downward, means coupled to said filing cabinet for selectively moving said storage unit between a retracted location within said cabinet and an accessible location outside thereof, said accessible location permitting said books to be opened and read in situ, said books retaining said reading position in both of said locations, and book-closing means interactive with said filing cabinet for causing any portions of said books projecting beyond either one of said opposite sides to be displaced inwardly of said storage unit when said storage unit is moved from said accessible location to said retracted location in said cabinet.

4,037,896

TRAY SLIDE AND SUPPORT THEREFOR

Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Oct. 30, 1975, Ser. No. 627,145
Int. Cl.[2] A47B *96/18, 5/00*
U.S. Cl. 312—281 **4 Claims**



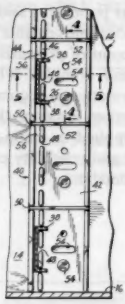
1. A tray slide device, especially for a serving counter, comprising, a frame having front and back elongate rail members, and an elongate resilient tray support member having a tray support surface and dependent front and back edge portions adapted resiliently to engage said rail members of the frame for releasably holding said support member on the frame, said rail members of said frame being in the form of a pair of parallel tubular elements spaced in a substantially horizontal plane, and each edge portion of said support member is curved in cross section to embrace a portion of the periphery of the respective rail member, longitudinally spaced bracket means for perpendicularly and horizontally spacing said tubular elements and fixed thereto.

4,037,897

VERTICALLY INDEXED DRAWER GUIDE SUPPORT STRIP

Edward P. Siggia, Armonk, N.Y., assignor to Edward P. Siggia Inc., Mamaroneck, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,234
Int. Cl.[2] A47B *88/04;* A47F *5/00*
U.S. Cl. 312—343 **14 Claims**



1. In a drawer support construction in which a U-shaped cross-section drawer guide is adapted to provide for sliding movement of a drawer in a cabinet, the drawer guide being at least partially supported by a support member fastened to the rear wall of such cabinet, the improvement comprising

a improved support member in the form of a support strip including a web; and

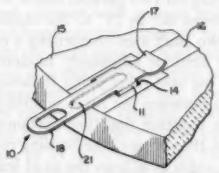
a pair of spaced parallel vertical flanges perpendicular to said web, said flanges defining a channel for receiving the end of the central body portion of the U-shaped cross-section drawer guide, one of said flanges including a series of horizontally extending slots spaced along the length of said one flange for receiving and accommodating the two legs of the U-shape at the end of said drawer guide for support of said end of said drawer guide.

4,037,898

SNAP-IN ELECTRICAL TERMINALS

Edward L. Guyette, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 28, 1972, Ser. No. 283,985
Int. Cl.[2] H05K *1/02*
U.S. Cl. 339—17 C **5 Claims**



1. A terminal for providing electrical connection between an external conductor and a conductive film deposited on a nonconductive substrate, the terminal being fabricated from a single, flat sheet of resilient, conductive material and comprising:

a center portion having a forward extension to which the external conductor may be attached and a rearward extension curved downwardly into electrical contact with the film on the substrate; said center portion being formed with a recess having an underside which is in contact with the film when the terminal is installed on a substrate; and

a plurality of legs extending from the center portion and bent downward substantial 90° from the center portion, each leg having at its terminus a tab, with the legs inserted into a corresponding slot in the substrate, so that the tabs guide the legs into the slot and then snap out and lock in place as they emerge from the slot at the bottom of the substrate, thereby securing the terminal to the substrate, wherein said plurality of legs comprises two legs extending from opposite sides of the center portion, one of the legs having a recess extending from its lower edge along its longitudinal axis.

4,037,899

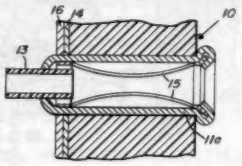
MINIATURE SOCKET ASSEMBLY

Kenneth E. Crowell, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 563,746, March 31, 1975, abandoned. This application Dec. 29, 1975, Ser. No. 644,666

Int. Cl.[2] H05K *1/10*

U.S. Cl. 339—17 C **5 Claims**



1. An improved socket assembly for receiving component guide pins, including in combination:

a base formed of insulating material and having plated conductor means on at least one side thereof;

a socket means mounted on said base and extending therethrough a predetermined distance, said socket means including a throughbore along the longitudinal axis with openings at respective ends thereof,

said base and socket means mounted thereon being adapted for flow wave soldering treatment to permanently interconnect said socket means to said plated conductor means;

resilient conductive means positioned in the socket means for applying additional pressure on an inserted guide pin, and

a resilient plastic tubing insert extending through the opening of said socket means from the side of said base having said plated conductor means thereon and into a portion of the interior of the resilient conductive means, said insert being positioned in the socket means during the manufacture of said socket means, maintained therein during the soldering operation and removable by the insertion of said guide pins.

4,037,900

BASEBOARD FOR ELECTRICAL INSTALLATIONS

Fritz Schmidger, Loomatt Atrium 4, Stallikon,Zurich, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,696

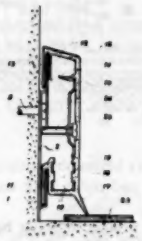
Claims priority, application Switzerland, Apr. 13, 1973, 5316/73

Int. Cl.[2] H01R *7/28*

U.S. Cl. 339—23 **4 Claims**

1. Baseboard for electrical installation comprising:

an elongated hollow cover board made of a plastic material and having a front side and a rear side, said rear side including a longitudinally extending insulating material portion, said cover board including: (1) a longitudinally extending flat section on the front side of said cover board for mounting electrical distributing apparatus so that the latter are accessible from the outside of the cover board; (2) longitudinally running bare wires partly embedded in the insulating material portion on the rear and normally concealed side of the cover board, outside the region of said flat mounting section; and (3) holding means on the rear side of the cover board, in the region of said bare wires for the removable application of adapters connected



to said electrical distributing apparatus and provided with bare contacts for connecting said apparatus to the bare wires; and

fastening means for securing said cover board to a wall, said fastening means consisting of fastening screws and a plurality of metallic supports, each of which is provided with upwardly directed tabs for suspending the cover board, and furthermore with lateral stops limiting an area having a rough surface against which, in the completely installed condition, the free end of the fastening screw borne by the cover board rests.

4,037,901

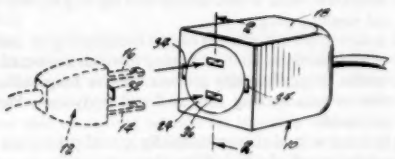
ELECTRICAL SAFETY SOCKET

Edward H. Kaszuba, 300 Winston Drive, Cliffside Park, N.J. 07010

Filed Apr. 28, 1976, Ser. No. 681,331

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—41 **9 Claims**



1. An electrical safety socket comprising:

a housing,

a rotatable socket element within said housing adapted to axially receive the contact prongs of an electrical plug,

a pair of electrical contact elements fixed to said rotatable socket element,

a pair of stationary electrical contact elements in said housing adapted to be connected to a source of electrical power, and

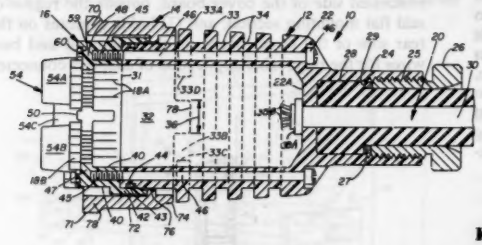
rotation means in said housing operatively axially movable relative to said socket in response to the axial insertion of the prongs of said electrical plug into said socket element and into electrical contact with said contact elements fixed to said socket element for engaging with and rotating said socket element to a position electrically connecting said socket contact elements with said stationary contact elements.

4,037,902

HERMAPHRODITIC MULTIPLE CONNECTOR PLUG

Sheldon M. Miller, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Mar. 16, 1976, Ser. No. 667,406
Int. Cl.[2] H01R *25/10*
U.S. Cl. 339—49 R **10 Claims**



1. In a high density hermaphroditic electrical connector plug adapted to couple and mesh with an identical meshing plug comprising;

a. said electrical connector plug having a cable end and a meshing end, the cable end connected to a multi-conductor cable;

b. said electrical connector plug comprising;

1. a cylindrical body;

2. a unitary cylindrical sealed contact assembly means attached and sealed to said body to support a plurality of electrical contacts inside said contact assembly means;

3. said contact assembly means of said electrical connector plug having two circumferentially spaced projections in the meshing end, which mesh in only one angular colinear position with the projections of an identical contact assembly means on said identical meshing plug, and wherein when said contact assembly means projections of said electrical connector plug and said meshing plug are meshed, the electrical contacts of said electrical connector plug and said meshing plug are also meshed;

the improvement in means to lock and unlock said electrical connector plug and said identical meshing plug, comprising;

c. a cylindrical locking ring on said electrical connector plug surrounding said body and contact assembly thereof and adapted to mate with a similar locking ring on said identical meshing plug;

d. means to permit rotation of said locking ring on said body of said electrical connector plug through a selected angle;

e. means to substantially prevent relative longitudinal motion of said locking ring and said body on which it is mounted;

f. first and second circumferentially spaced projection on the meshing end of said locking ring;

g. a single sloped groove in the inside surface of said first projection forming a first ridge on the inside end of said first projection, and on the outside surface of said second projection, forming a second ridge on the outside end of said second projection, said first ridge on said first projection of said locking ring of said electrical connector plug adapted to fit into a groove of a second projection, of said locking ring on said identical meshing plug, and vice versa;

whereby as said locking ring on said electrical connector plug is rotated clockwise with respect to said locking ring on said meshing plug, said ridges will slide in the corresponding grooves, and because of the slopes of the grooves, the two locking rings will be pulled together, and with them said electrical connector plug and said meshing plug; and wherein said electrical connector plug includes the further improvement comprising;

h. a first longitudinal edge of said projections on said locking rings of said electrical connector plug and said meshing plug being the leading edge where said ridges and said grooves first mesh;

i. the ends of said projections cut perpendicular to the axis of said locking rings, at said leading edges;

j. the ends of said projections cut at a selected small slope angle to said perpendicular to the axis of said locking rings at the trailing edges of said projectons;

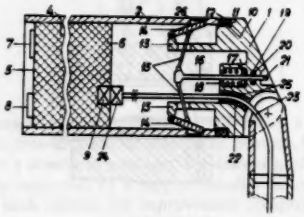
k. whereby, after rotating said locking rings of said electrical connector and meshing plugs in a clockwise direction and said two plugs are pulled together, as said locking rings are rotated counter clockwise with respect to each other, said sloping ends of said projectons will slide, one on the other, and will pull apart said locking rings and with them said electrical connector plug and said meshing plug.

4,037,903

CASING

Kaspar Saner, Dubendorf, Switzerland, assignor to Wirth, Gallo and Company, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,416
Claims priority, application Switzerland, Oct. 23, 1975, 13850/75
Int. Cl.[2] H01R *13/52, 13/54, 13/58*
U.S. Cl. 339—75 R **6 Claims**



1. A casing for an electrical apparatus having a front wall and a back wall, an electrical plug on said back wall, said casing having a base, a jacket in which said apparatus is mounted, stop spring means between said base and said jacket, said means comprising a rod slidably mounted in said base, a spring loading said rods and fingers rotatably mounted in said base and operatively connected with said rod, said rod having an end protruding outside said base, said jacket being thereby detachably fixed to said base, a passage in said base, a set of cables through said passage, a plug socket fixed to said cables, said back wall, said jacket and said base forming a water sealed room, said plug and said plug socket being within said room when said jacket is fixed to said base.

4,037,904

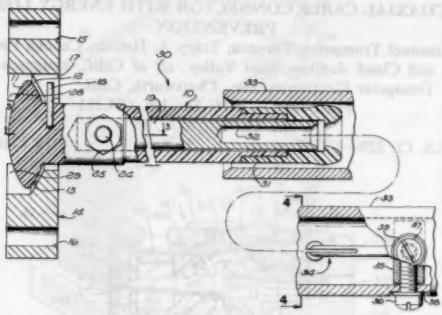
ELECTRICAL CONNECTOR

Bruce K. Arnold, El Toro, and Stephen K. Yamamoto, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,347
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—64 R **9 Claims**

1. A fail-safe electrical connector for mounting between a fixed structure and a door structure, said connector comprising: a plate for mounting on one of the structures, the plate having a hole therethrough, said hole having a center axis; a hollow tubular insulator assembly connected with said plate and having its longitudinal axis generally coaxial with said center axis but being movable to a position somewhat misaligned therewith; a hollow tubular member having a rearward end fixed to the other structure and a forward end movable toward and said plate; a pin contact having a forward end portion enlarged in at least one dimension transverse to the length of said pin coaxially mounted within said member; said

insulator assembly having a forward end and a rear end, said insulator assembly forward end being loosely slidable inside said member forward end, a bore extending through said insulator assembly forward end providing an opening at said insulator assembly forward end; means providing a generally free-floating connection between said rear end of said insulator



assembly and said plate, said free-floating connection means allowing variation in the position of said insulator assembly sufficient to accommodate axial and angular misalignment between said center axis and said longitudinal axis; and a socket contact mounted in said bore mating with said pin contact when either one of the structures is moved toward the other.

4,037,905

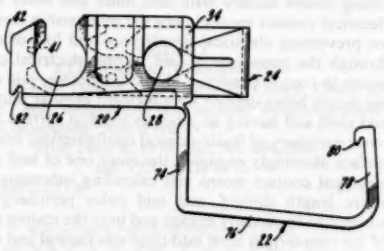
NO-STRIP ELECTRICAL CONNECTOR

James F. Lucas, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 435,107, Jan. 21, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,252

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—98 **14 Claims**



1. A no-strip electrical connector comprising a connector body of insulating material with two longitudinal wire-receiving channels, at least one of which extends throughout the entire length of the body and opens along a top longitudinal surface of the body to accept a through wire, the other channel being for a tap wire and being also bordered by the top surface of the body and containing a generally transverse stop surface, the connector body having side openings disposed intermediate the length of the tap wire channel through a longitudinal side of the body normal to the top surface and adjacent the tap wire channel and through the connector body between the channel, and a generally bent-over, two-legged conductive insert for inserting into the opening in the side of the connector body, both ends of the insert being slotted to form U-shaped contact members on the ends thereof which, when simultaneously forced into the insulated wires lying in the channels, penetrate the insulation of the wires and make an electrical contact between them, one leg of the insert being longer than the other and being adapted to engage the through wire lying in the through wire channel, the shorter leg being adapted to engage the tap wire lying in the tap wire channel when the insert is forced into the connector body, said connector body having as an integral part thereof a hinged cover flap with means for locking it in a closed position over the top and side of the body so as to cover the channels and side opening.

4,037,906

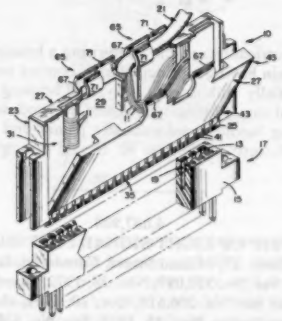
ELECTRICAL CONNECTOR AND CONTACT

Max Leroy Jayne, North Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 22, 1976, Ser. No. 669,193

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—107 **13 Claims**



1. An electrical connector for electrically interconnecting at least one electrical wire and at least one electrical contacting member positioned within an insulative member, said connector comprising:

an electrically insulative housing comprising a body portion including at least one recessed area therein adapted for having said wire located therein and at least one contact receiving portion positioned relative to said recessed area, and an extending portion extending from said body portion;

at least one electrical contact comprising a contacting portion positioned within said contact receiving portion of said housing for electrically contacting said wire when said wire is positioned therein, a retention portion adjacent said contacting portion for retaining said contacting portion of said contact within said contact receiving portion of said housing, and a tail portion adjacent said retention portion and adapted for electrically contacting said contacting member within said insulative member, said tail portion extending from said body portion of said housing in an engaged relationship to said extending portion of said housing; and

at least one cover means comprising first and second opposing end portions, said first end portion pivotedly mounted on said housing in the region substantially adjacent said contact receiving portion, said second end portion adapted for covering said recessed area of said housing, said second end portion including latching means for positively engaging said body portion of said insulative housing to latch said second end portion to said housing;

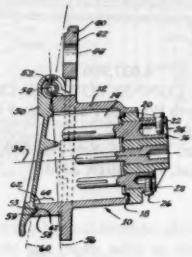
characterized in that said cover means includes first strain relief means for relieving tensile strain on said electrical wire when said wire is positioned within said contacting portion of said electrical contact.

4,037,907

TRACTOR-TRAILER ELECTRICAL RECEPTACLE

Boleslaw M. Klimek, Des Plaines, and Victor Mastis, Hinsdale, both of Ill., assignors to The Echlin Manufacturing Company, Branford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,491
Int. Cl.² H01R *13/52, 13/60*
U.S. Cl. 339—126 R **10 Claims**



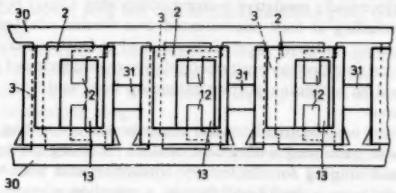
1. An electrical receptacle comprising a housing including a cavity therein having a principal axis, contact means mounted at least partially within said cavity, said housing having a first end and said cavity being open at said first end, said first end of said housing having a substantially planar end surface at an angle significantly other than 90° to said principal axis of said cavity.

4,037,908

STRIP OF LIGHT-SIGNAL UNIT SHELLS

Cesare Gallone, 27, Milano Street, Cornaredo, Italy

Division of Ser. No. 310,097, Nov. 28, 1972, abandoned, which is a division of Ser. No. 206,610, Dec. 10, 1971, abandoned. This application Nov. 25, 1975, Ser. No. 635,387
Claims priority, application Italy, Dec. 12, 1970, 32927/70
Int. Cl.² H01J *7/44, 61/64;* **H01K** *1/62;* **H01R** *3/02*
U.S. Cl. 339—147 R **4 Claims**



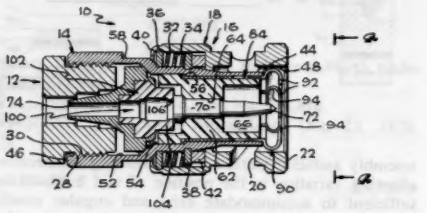
1. A strip of light-signal unit shells which can be formed into single light-signal units by installing a gas discharge bulb and a removable resistance element and separating the light-signal unit shells from the strip thereby providing single light-signal units which may be inserted into a signalling device, said strip comprising a flat sheet of conductive material having openings which form continuous longitudinal conductors along two opposite edges of said sheet, continuous transverse conductors extending from one longitudinal conductor to the other and a pair of discontinuous conductors extending from opposite continuous longitudinal conductors adjacent each of the continuous transverse conductors and terminating in free ends, insulating shells provided with a recess, each insulating shell encapsulating a portion of one continuous transverse conductor and portions of an adjacent pair of discontinuous conductors, the free ends of each pair of discontinuous conductors extending into the recess of the shell associated therewith whereby the continuous longitudinal conductors may be severed adjacent each continuous traverse conductor and each discontinuous conductor to form terminals for installation of a gas discharge bulb and whereby the ends of the discontinuous conductors extending into the respective recesses may be bent at various angles in the respective recesses to receive and provide electrical contact with a removable resistance element.

4,037,909

COAXIAL CABLE CONNECTOR WITH ENERGY LOSS PREVENTION

Emanuel Trompeter, Tarzana; Tracy A. Hunter, Canoga Park, and Claud Azelton, Simi Valley, all of Calif., assignors to Trompeter Electronics, Inc., Chatsworth, Calif.

Filed June 9, 1976, Ser. No. 694,211
Int. Cl.² H01R *17/06*
U.S. Cl. 339—177 R **9 Claims**



1. An electrical cable connector, comprising:

a conductive hollow shell having axially opposite open forward and rearward ends, the rearward end being equipped for receiving the end of the cable to be attached to said connector;

first electrical contact means in said shell adapted to effect an electrical connection between said shell and the electrically conductive means of the cable;

inner and outer second electrical contact means at the forward end of said shell adapted to effect an electrical connection between said shell and the counterpart shell of a mating connector, and

shielding means unitary with said inner and outer second electrical contact means in coaxial relationship therewith for preventing electrical interference and loss of energy through the inner one of said second electrical contact means in couple condition of said connector, said shielding means being defined by a forward annular portion of said shell and having an inner cylindrical surface and an outer periphery of frusto-conical configuration, said inner surface abuttingly engaging the inner one of said second electrical contact means and extending substantially the entire length thereof, and said outer periphery being adapted to frictionally engage and urge the mating surface of the counterpart shell into tight mechanical and electrical contact with the outer one of said second electrical contact means in the coupled electrically conductive condition of the shells.

4,037,910

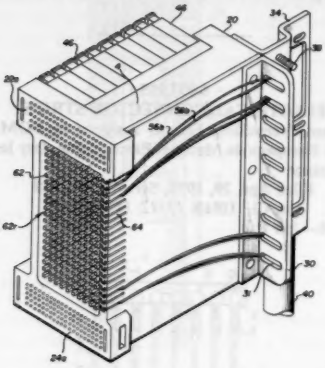
TELEPHONE DISTRIBUTION FRAME CONNECTOR ASSEMBLY

Edward S. Paluch, Elmwood Park, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Sept. 13, 1976, Ser. No. 722,426
Int. Cl.² H01R *9/00*
U.S. Cl. 339—198 R **6 Claims**

1. A telephone distribution frame connector assembly comprising an insulating connector block having a front face, a rear face, and opposed side faces, means for mounting said block on a distribution frame such that said rear face is adjacent to said frame and said front face is remote from said frame, one of said side faces having groups of socket-type electrical terminals for receiving a plurality of plug-in overload protector modules, the opposite side face having terminals for wired connection to

central office equipment, a cable stub adjacent to said rear face, means for securing said cable stub to said block, said cable stub having wires in electrical connection with said socket type terminals for completing subscriber circuits from the wires of the cable stub to said opposite face terminals, a test field at said



front face and accessible without interference from members of said frame or adjacent blocks or modules thereon, and wires electrically connecting said test field to some of said socket-type terminals so as to provide a means for testing the subscriber circuits.

4,037,911

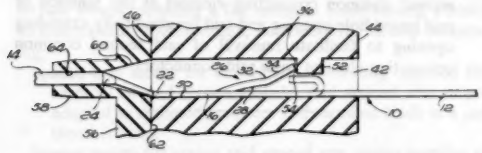
ELECTRICAL CONNECTOR

John W. Anhalt, Orange, and James H. Curley, Costa Mesa, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 9, 1976, Ser. No. 694,306

Int. Cl.[2] H01R *9/16*

U.S. Cl. 339—217 S **13 Claims**



1. An electrical contact adapted to be mounted in a contact cavity in an insulator of an electrical connector comprising:

an electrically conductive body having a forward contacting section and a retention section behind said contacting section;

a spring retention tine on said retention section extending forwardly and outwardly therefrom so that the end thereof may engage a rearwardly facing shoulder in said cavity; and

said tine embodying a relatively deformable area spaced from said end and the point of emergence of said tine from said body whereby, upon the application of a predetermined rearwardly directed force to said end of said tine, said tine will fold back on itself at said deformable area.

4,037,912

TERMINAL ASSEMBLY

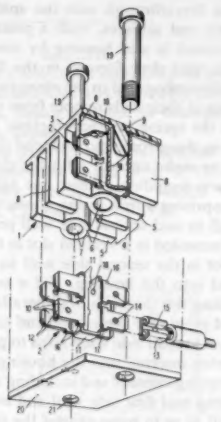
Helmut Siegfried Besser, Williston, Vt.; Gunter Kieven, Bodenheim, and Jurgen Wettlauffer, Mainz, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1976, Ser. No. 688,654

Claims priority, application Germany, May 24, 1975, 2523164

Int. Cl.[2] H01R *9/18*

U.S. Cl. 339—198 R **7 Claims**



1. A terminal assembly comprising a housing composed of a rigid insulating material, said housing including spaced apart wall members projecting from a base plate and defining a chamber therebetween; an elongated protuberance on each of said wall members in coextension with the extension thereof and projecting inwardly into said chamber; a U-shaped connector member for insertion into said chamber, said connector member formed from a strip of conductive material and having upstanding, spaced apart leg portions joined by a bottom portion; oppositely directed terminals formed from U-shaped segments of said leg portions in projection therefrom, with said terminals having common directional projections on each common leg portion, and with the terminals on one leg portion having an oppositely directed projection relative to that of the terminals on the other of said leg members, and means on said conductive strip for providing locking engagement with said abutments when said connector member is inserted into said chamber whereby said connector member is fixedly secured in said chamber.

4,037,913

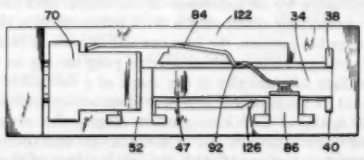
PRINTED CIRCUIT JACK

James C. Deitch, Bloomington, and Lawrence F. Leistiko, Minneapolis, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 549,731, Feb. 13, 1975, abandoned. This application June 1, 1976, Ser. No. 691,891

Int. Cl.[2] H01R *13/50*; **H05K** *1/04*

U.S. Cl. 339—221 M **9 Claims**



1. A molded jack especially suitable for direct connection on

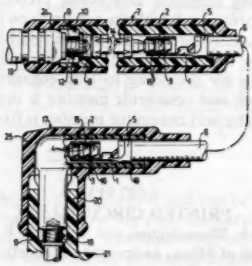
its bottom side to a printed circuit board comprising an elongated molded nonconducting housing having an elongate axis and first and second generally parallel end surfaces generally perpendicular to the elongate axis at opposite ends of the housing, said surfaces connected together by elongated first and second generally parallel side walls extending therebetween, parallel to the elongate axis, said end surfaces also connected together by a third elongated side wall intermediate said first and second side walls, and said housing having an entrance hole in said first end surface to accept a plug along the elongate axis therethrough into the space between the side walls, and the end surfaces, with a plurality of spring metal contacts mounted in said housing by means of a plurality of vertical slots, said slots formed in the first and second side walls generally orthogonal to the elongate axis of said housing, said slots open at their ends remote from said third side wall so as to accept the spring contacts therein, said contacts having lugs extending therefrom which extend through the bottom of the housing to make contact with the circuit board, and said spring contacts including at least one pair of balanced spring contacts comprising a first spring contact extending from said first side wall to said second side wall proximate the first end surface and mounted in a vertical slot in the first side wall and a vertical slot in the second side wall so as to press against a plug inserted into the housing, and a second spring contact extending along the third side wall parallel to the elongate axis and mounted proximate the second end surface in vertical slots in the first and second side walls so as to press against the other side of the plug inserted into the housing to balance the force of said first spring contact and including a third spring contact mounted along said first side wall and in vertical slots in said first side wall so as to press against the side of a plug inserted into the housing.

4,037,914

ELECTRICAL CONNECTOR AND CONNECTOR CABLE

Martin Fetzer, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 30, 1975, Ser. No. 627,051
Claims priority, application Germany, Nov. 14, 1974, 37955
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—253 R **2 Claims**



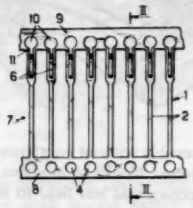
1. An electrical connector cable comprising an insulated conductor connected at each end to an electrical connector comprising a connector socket and a connector plug, each connector socket being permanently electrically connected to said conductor by an extension of the socket and having inwardly projecting catch ridges on a substantially cylindrical metallic socket portion, the two connector sockets being identical in configuration, each connector plug having an engagement surface substantially in the shape of a surface of revolution about its longitudinal axis providing substantially circumferential grooves and inter-groove ridges, the plugs being engaged in each case in one of said sockets and the ridges of said plugs being engaged with the catch ridges of that one of said sockets and at least one of said plugs having forward and rear slope inclinations differing from each other, the former being the greater, whereby the force required for disengagement of said socket and plug is substantially raised relative to the force required for their engagement, the engagement surfaces of one of the plugs being different from those of the other so that different amounts of force are required for their respective disengagement from the corresponding socket.

4,037,915

ELECTRICAL CONNECTOR STRIPS

Aimé Cabaud, Versailles, France, assignor to COMATEL - Comptoir Europeen de Materiel Electronique, Issy les Moulineaux, France

Filed Apr. 29, 1976, Ser. No. 681,488
Int. Cl.[2] H01R *13/12*; H05K *1/07*
U.S. Cl. 339—258 P **3 Claims**



1. A connector strip for a circuit board comprising

a plurality of spaced solderable connectors;

each of said connectors having first and second end portions and a flat central portion extending along a longitudinal axis between said end portions;

a first common connecting element connecting together said first end portions;

each of said second end portions having a fork configuration formed by spaced leg portions;

a second common connecting element connecting together said second end portions;

said second common connecting element having a plurality of openings formed therein, each individual opening being aligned with the axis of respective connectors; and

each said opening formed with a keyhole configuration having its round hole opening located within said second common connecting element and its longitudinally extending opening forming the spacing between said leg portions whereby a weakened portion is formed in said second common connecting element at the junction of said round hole opening and said longitudinally extending opening to facilitate removal of said second common connecting element from said connectors.

4,037,916

HIGH CURRENT DENSITY ELECTRICAL CONTACT

Lloyd E. Thompson, Jr., 158 Clark Road, Rye, N.H. 03870

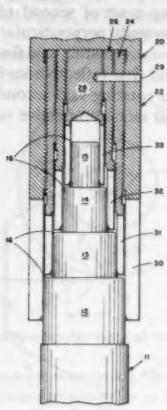
Filed Apr. 12, 1976, Ser. No. 676,446
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **12 Claims**

7. An electrical contact comprising:

a contact pin having a plurality of contacting surfaces of decreasing size; and

a receptacle having a like plurality of sections disposed one within another each of which is provided with contacting surfaces which mate with respective pin surfaces during the full extent of insertion of said pin into receptacle as defined by the axial length of the shortest of said pin contacting surfaces,

said receptacle sections joined together remote from their contacting surfaces to form a unitary member.

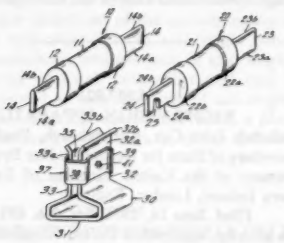


4,037,917

FIELD INSTALLED FUSE REJECTION MEANS WITH SPRING BETWEEN CLIP JAWS

Ralph C. Clement, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jan. 20, 1976, Ser. No. 650,691
Int. Cl.[2] H01H *85/24*
U.S. Cl. 339—259 F 8 Claims



1. A fuse terminal clip for forming an electrical connection to fuse means including a flat terminal blade having a notch formed partially therethrough, said fuse terminal clip comprising;

spaced arm means for electrically contacting opposed flat surfaces of said terminal blade, said spaced arm means adapted to resiliently capture said terminal blade in a gap therebetween;

biasing means for urging said spaced arm means together to increase the electrical conductivity between said spaced arm means and said terminal blade captured therebetween;

a rejector member extending between said spaced arm means and cooperating with said notch for rejecting a terminal blade lacking said notch and for facilitating insertion and capture between said spaced arm means only of a terminal blade provided with said notch;

collapsible retainer means carried on said rejector member for permitting placement of said rejector member between said spaced arm means and expanding upon being so emplaced to substantially prevent removal of said rejector member from said spaced arm means;

said spaced arm means including a pair of spaced parallel clip arms each having an aperture formed therethrough and the axes of both said apertures being in alignment;

said biasing means comprising a spring member having a pair of spaced arms each bearing resiliently against an associated one of said pair of clip arms and having an aperture formed therethrough in axial alignment with the aperture formed in said associated clip arms; and

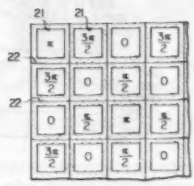
said rejector member extending through the aligned pair of apertures, across the gap formed between said pair of clip arms and also extending through each of the apertures in said spring arms.

4,037,918

FOURIER-TRANSFORM HOLOGRAPHY BY PSEUDO-RANDOM PHASE SHIFTING

Makoto Kato, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 31, 1975, Ser. No. 600,589
Claims priority, application Japan, Aug. 3, 1974, 49-89248; Apr. 23, 1975, 50-49930; Apr. 23, 1975, 50-49931
Int. Cl.[2] G03H *1/16, 1/32*
U.S. Cl. 350—3.5 23 Claims



1. Apparatus for forming a hologram of an array of beams of electromagnetic radiation on a Fourier transform plane, comprising:

a pseudo-random phase mask receptive in use of a beam of electromagnetic radiation and comprised of phase shifting areas arranged in a pattern of rows and columns, there being an approximately equal number of phase shifting areas for each of the different phase shifts, wherein the number of different phase shifts is N which is at least three and each of the different phase shifts is one of the multiples of $m360°/N$, where m ranges from 1 to N, and the phase difference between orthogonally adjacent phase shifting areas is $360°/N$, whereby the power spectrum of said phase-shifted beam on the Fourier transform plane distributes in two orthogonal directions from the center maximum of the power spectrum; and

means for recording a hologram of the Fourier transform of said beam at said center maximum.

4,037,919

HOLOGRAPHIC DEVICE WITH DIVIDED OBJECT BEAMS, A MULTICOLOR LIGHT SOURCE AND DIRECTION-SELECTIVE SCREEN

Yasutsugu Takeda, Kokubunji, and Yoshito Tsunoda, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 398,550, Sept. 18, 1973, abandoned.
This application May 12, 1975, Ser. No. 576,460
Claims priority, application Japan, Sept. 19, 1972, 47-94032; Feb. 19, 1973, 48-19879
Int. Cl.[2] G03H *1/16, 1/30*
U.S. Cl. 350—3.5 2 Claims

1. A holography apparatus comprising:

a first recording medium on which are arranged a plurality of two-dimensional multi-color photographic recordings of a three-dimensional object taken from a plurality of different photographic directions;

first means for providing a plurality of collimated coherent light beams of respectively different monochromaticities;

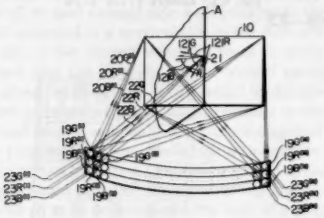
second means, disposed in the path of each of said coherent light beams, for separating said beams into respective collimated object beams and reference beams;

a hologram recording medium;

third means comprising a lens for focussing each of said collimated object beams, selectively, through each respective two-dimensional multi-color photographic recording on said hologram recording medium, said object beams thereby converging upon adjacent respective holographic recording areas of said hologram recording medium;

fourth means, disposed in the paths of said respective converging object beams for each respective photographic recording, for dividing each of said converging object beams into a plurality of separated smaller converging beams traveling along the direction of convergence of each respective object beam onto respective adjacent recording areas of said hologram recording medium; and

fifth means for directing said respective reference beams



onto the adjacent respective holographic recording areas of said hologram recording medium simultaneously with the respective pluralities of separated smaller converging object beams which have been selectively focussed through a respective two-dimensional multi-color photographic recording on said first recording medium, to thereby from respective adjacent holograms of different monochromaticities of the multi-color information carried in a respective two-dimensional multi-color photograph of said three-dimensional object corresponding to a respective one of said different photographic positions on adjacent respective prescribed portions of said hologram recording medium; and

further comprising means for reproducing said holograms, said reproducing means including

a multi-color light source for illuminating said holograms with multi-color light beams; and

a direction-selective screen disposed at an image surface on which multi-color light beams from said multi-color light source having passed through said holograms form reproduced images of the respective holograms.

4,037,920

RADIATION SCANNING SYSTEM WITH TWO RELATIVELY MOVABLE REFLECTORS

Herbert Morrison Runciman, and Peter John Berry, both of Glasgow, Scotland, assignors to Barr and Stroud Limited, Glasgow, Great Britain

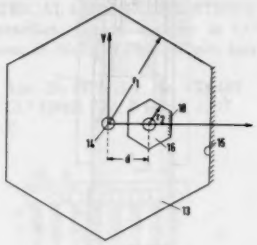
Filed July 29, 1975, Ser. No. 600,199

Claims priority, application United Kingdom, Oct. 26, 1974, 46424/74

Int. Cl.[2] G02B *27/17*; H01J *3/16*

U.S. Cl. 350—7 **5 Claims**

1. Apparatus for use in a radiation scanning system comprising an objective device forming convergent radiation from a field of view, a radiation detector, and an optional scan means which is arranged to scan convergent radiation from said field of view across said detector, said scan means comprising a first drum which is rotatable about a first axis, a first set of optical members mounted on said first drum and defining a set of first planar reflective surfaces each of which extends perpendicular to a radius of said first drum, a second drum which is rotatable about a second axis extending parallel to and spaced from said first axis, a second set of optical members mounted on said second drum and defining a set of second planar reflective surfaces each of which extends perpendicular to a radius of said second drum, drive means rotating said first drum sequentially to move each of said first reflective surfaces through a first reflector station, and rotating said second drum sequentially to move each of said second reflective surfaces through



a second reflector station, said scan means being arranged with the respective reflective surfaces when in said first and second reflector stations oppositely facing and the first and second reflector stations axially spaced, whereby convergent radiation from said field of view enters said detector after sequential reflection at said first and second reflector stations, said drums each having the same number of planar reflective surfaces and said drive means providing synchronous rotation of said drums, and the distance between said reflector stations in a plane perpendicular to said first and second axes being equal to the spacing between said axes in the same plane.

4,037,921

NIGHT VISION APPARATUS

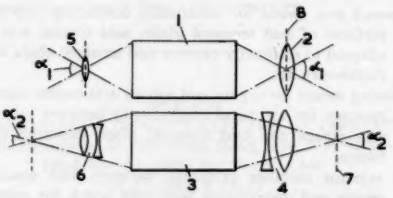
Alan Frederick John Cox, Christchurch, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 14, 1976, Ser. No. 695,628

Claims priority, application United Kingdom, June 17, 1975, 25831/75

Int. Cl.[2] G02B *23/12*

U.S. Cl. 350—36 **6 Claims**

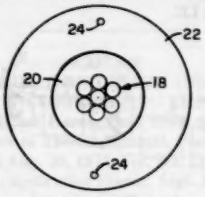


1. Night vision apparatus comprising means for providing two intensified images of a scene, one of said images providing a comparatively wide-angle view of said scene, and the other of said images providing a comparatively narrow-angle view of said scene, but with better resolution, and observation means for enabling both of said intensified images to be observed simultaneously in superposed relationship with the same overall magnification.

4,037,922
OPTICAL WAVEGUIDE CABLE

Stewart A. Claypoole, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 7, 1975, Ser. No. 593,285
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96 B 18 Claims

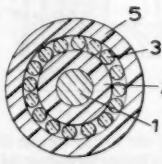


1. A substantially circular optical waveguide cable comprising:
- a plurality of optical waveguide fibers disposed in a substantially contiguous relationship to form a single concentrically arranged fiber bundle,
- an encapsulating coating of at least one layer surrounding said single bundle of fibers, and
- at least two strength members embedded in said encapsulating coating and disposed parallel to said single bundle in a plane substantially along a diameter of said single bundle through the longitudinal axis of said bundle, at least one of said strength members being disposed in said plane on one side of said single bundle, the remainder of said strength members being disposed in said plane on the other side of said single bundle, each strength member on said one side of said single bundle being disposed at a distance from said longitudinal axis of said single bundle substantially equal to the distance therefrom of the corresponding strength member on said other side of said single bundle, said strength members on said one side of said single bundle being disposed adjacent each other and said strength members disposed on said other side of said single bundle being disposed adjacent each other when a plurality of strength members are disposed on either or both of said sides.

4,037,923
OPTICAL GUIDES WITH COMPRESSIBLE CELLULAR MATERIAL

Richard Ernest Beal, Wigan, England, assignor to BICC Limited, London, England

Filed June 25, 1974, Ser. No. 482,993
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96 B 4 Claims

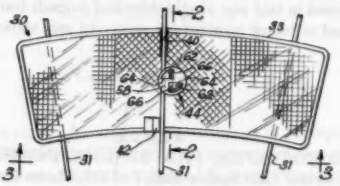


1. An optical guide consisting of an optical cable comprising at least two optical bundles, each comprising a group of fibres including a plurality of optical fibres assembled about and in contact with a longitudinally extending central elongate member of which at least an outer peripheral layer is of compressible cellular material and, surrounding the bundles and the central member, an outer protective sheath, the arrangement being such that when the cable is stressed in such a way as to subject optical fibres of at least one of the optical bundles to a tensile force, the optical bundle can move transversely inwardly to compress the compressible cellular material of the central member and thereby reduce the strain that would otherwise be imparted to said optical fibres, and a covering layer of compressible cellular material between the optical bundles and the surrounding protective sheath.

4,037,924
RETROREFLECTIVE MARKER DEVICES FOR ATTACHMENT TO SPOKES OF BICYCLE WHEELS OR THE LIKE

Louis May, Skokie, Ill., assignor to Sate-lite Mfg. Co., Harwood Heights, Ill.

Filed June 20, 1975, Ser. No. 588,731
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—97 12 Claims

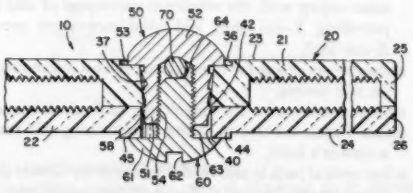


1. A retroreflective marker device for attachment to a wheel having a plurality of wire spokes spaced apart at predetermined intervals,
- said device comprising a retroreflective marker member having a boss projecting therefrom,
- said marker member having an opening extending into said boss with internally screw-threaded means in said opening,
- and a clamping screw movably received in said opening and engaged with said internally screw-threaded means,
- said boss having a locating groove therein disposed off center relative to said opening for receiving and retaining one wire spoke of said wheel,
- said clamping screw having a clamping head disposed opposite said groove for directly engaging said spoke and clamping said spoke into said groove to retain said marker member on said spoke.

4,037,925
REFLECTOR ASSEMBLY

Robert S. Fleming, Pompton Plains, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 634,305
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—97 12 Claims



1. Apparatus comprising:
- a. a member adapted to be mounted to the spoke of a wheel, said member having a portion defining an outer surface, an

opening in said member extending through said member and said outer surface;

b. a fastener element having a head and a shank;

c. said shank being bifurcated and extending axially from said head, said shank being adapted to be disposed in said opening in said member with said head of said element engaging said member;

d. said bifurcated shank defining an axially extending transverse opening in said element adapted to receive said spoke of said wheel; and

e. means for locking said spoke, said element and said member together when said spoke is received within said opening positioned between said head and said outer surface is said member, wherein said member further comprises a groove in said outer surface intercepting said opening, said groove being adapted to receive said spoke and retain said member relative to said spoke, wherein said member comprises a reflector member, said reflector member having a pair of opposed light-receiving sides, one of said sides including said outer surface, and said groove is disposed in said one of said sides and extends transversely of said reflector member for receiving said spoke.

4,037,926

PHOTOGRAPHIC FILM READING INSTRUMENT

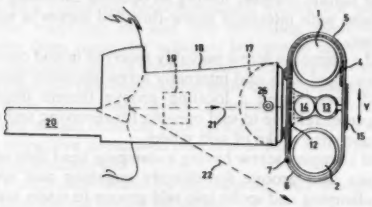
Harry Arthur Hele Spence-Bate, Lot 115, Cheam Place, Morley, Western Australia, 6062, Australia

Filed Oct. 31, 1974, Ser. No. 519,674

Claims priority, application Australia, Nov. 5, 1973, 5534/73

Int. Cl.² G02B 27/02, 27/22

U.S. Cl. 350—135 **8 Claims**



1. A photographic film reader comprising:

a casing, means in said casing for holding a micro image bearing microfiche lamina;

means connected to said holding means for moving said lamina in both an X-axis and a Y-axis direction; said means comprising a pair of equal sized rollers mechanically coupled for synchronous rotation in the same direction and further arranged for axial movement, the rollers being constructed so as to grip the lamina and to provide a passage for said lamina between the roller surfaces and the inner casing wall, the rotational movement of said rollers providing Y-axis shift and axial movement providing X-axis shift,

means in said casing for illuminating at least one micro image on said lamina,

means in said reader for magnifying said micro image,

means connected to said casing for attaching said reader to a viewer's head,

a first optical path in said reader between the viewer and said micro image through said magnifying means, and

a second optical path in said reader between the viewer and a point outside said reader such that the viewer may select without moving said casing or reader either said first or said second optical path by shifting his vision.

4,037,927

LIQUID CRYSTAL DISPLAY SCREEN WITH MULTIPLE ELECTRODE ARRANGEMENT

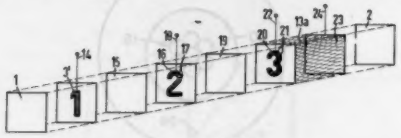
Hans Krueger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 21, 1975, Ser. No. 542,804

Claims priority, application Germany, Jan. 21, 1974, 2402749

Int. Cl.² G02F 1/16; G09F 9/32

U.S. Cl. 350—160 LC **6 Claims**



1. In a liquid crystal display screen which may be operated to separately display in time sequence at least two digits, said screen comprising a liquid crystal cell having two transparent carrier plates with a liquid crystal layer disposed therebetween, the improvement comprising a continuous, transparent electrical conductive layer disposed adjacent one of the two carrier plates and having a shape of a first digit and being provided with an electrical lead; at least one additional digit panel positioned between the layer forming the first digit and the liquid crystal layer, each of said additional digit panels having an interrupted electrical conducting layer in the form of a plurality of parallel strips delimiting an additional digit with said strips being interconnected to a single electrical lead and the strips of each additional digit panel extending in different directions, an insulating layer disposed between adjacent conductive layers, and electrical conducting electrode layer adjoining the other of said two carrier plates with the liquid crystal layer between the electrode layer and the digit panels so that a selected application of a potential on the electrode layer and a conductive layer of the digit creates an indication of the selected digit in the liquid crystal layer.

4,037,928

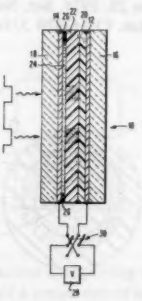
VISUAL IMAGE DISPLAY DEVICE

Robert Bruce Champ, and Meredith David Shattuck, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 4, 1976, Ser. No. 693,073

Int. Cl.² G02F 1/16

U.S. Cl. 350—160 R **12 Claims**



1. A visual image display device comprising:

a first and a second conductive electrode in spaced relationship;

a first barrier layer positioned between said electrodes adjacent to said first electrode,

a film of solvent positioned between said electrodes and adjacent

a second barrier layer positioned between said first barrier layer and said solvent film, said second layer being a normally light transmitting recording medium and having the properties of being both photoionizable and capable of electrochemically producing a colored specie, and

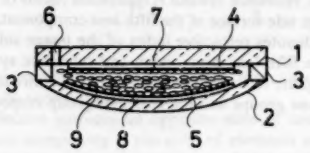
a voltage source and means for selectively applying this voltage between the electrodes to produce an electric field.

4,037,929

OPTICAL PROJECTION DEVICE AND AN OPTICAL READER INCORPORATING THIS DEVICE

Claude Bricot; Michel Hareng, and Erich Spitz, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Aug. 30, 1976, Ser. No. 718,475
Claims priority, application France, Sept. 3, 1975, 75.27008
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 6 Claims



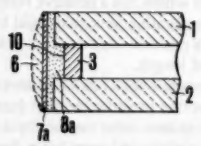
1. An optical projection device for focussing an optical beam having an optical axis and polarized rectilinearly in a direction Δ perpendicular to said optical axis, comprising a hollow glass lens arranged on the path of said beam, said hollow glass lens having inner walls and comprising two transparent electrodes arranged on said inner walls, supply means for applying to said two electrodes a variable electrical field, said lens containing a liquid nematic crystal having molecules capable of oscillating under the action of said electric field, the index thus presented by said liquid crystal to said beam varying between the ordinary index n_o and the extraordinary index n_E of said liquid crystal.

4,037,930

LIQUID CRYSTAL DISPLAY CELLS

Shigeru Matsuyama; Masaharu Koyama, both of Mobara; Masayoshi Kasai, Chiba; Mamoru Tsuzurahara, and Kazuo Sunahara, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 674,041
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 5 Claims



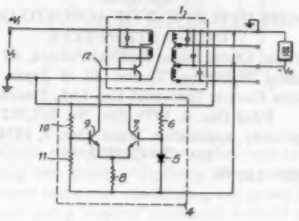
1. In a liquid crystal display cell of the type wherein a pair of insulating plates are hermetically sealed to a peripheral sealing member extending substantially entirely along the peripheries of said plates and therebetween and including at least one inlet port therein for filling a liquid crystal into the cell, the peripheries of the insulating plates slightly projecting beyond the periphery of the peripheral sealing member thus defining a shallow groove, the improvement which comprises a filler filling said groove about said inlet port, a metal layer which is applied to cover said filler and the side surfaces of said insulating plates, and an inlet port sealing member applied to said metal layer for sealing said inlet port.

4,037,931

LIQUID CRYSTAL DISPLAY CELL DRIVING CIRCUIT

Kazuo Ido, Suwa, and Shizuo Saito, Okaya, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed May 2, 1975, Ser. No. 574,179
Claims priority, application Japan, May 2, 1974, 49-49561
Int. Cl.[2] G02F 1/18
U.S. Cl. 350—160 LC 5 Claims



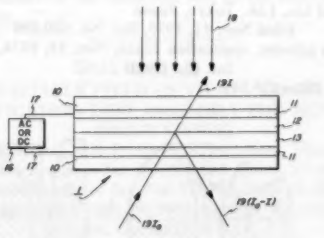
1. A drive circuit for applying drive signals to a temperature dependent liquid crystal display cell comprising in combination power source means including a DC converter coupled to said liquid crystal display cell, said DC converter including an input terminal means and an output terminal means, said output terminal means being coupled to said liquid crystal display cell for applying a DC drive voltage thereto, and feedback control means coupled to said input terminal means and said output terminal means for stabilizing the DC drive signal applied to said display cell, said feedback control means including a temperature dependent diode, said diode having a temperature dependency characteristic corresponding to said liquid crystal display cell to effect an adjustment of the DC drive voltage to compensate for the temperature dependency characteristic of the liquid crystal display cell.

4,037,932

ELECTROOPTIC-PHOTOCONDUCTOR SANDWICH USING ACTINIC READOUT LIGHT

Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,880
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 25 Claims



1. An imaging method comprising:

a. providing, without an optical blocking layer therebetween, a photoconductive layer and an electro-optic medium in between two electrodes;

b. applying a voltage between said two electrodes;

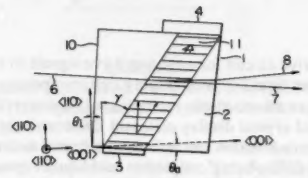
c. striking said photoconductive layer from one side with actinic radiation in imagewise configuration; and

d. uniformly striking said photoconductive layer from its other side with actinic radiation which is absorbed by said photoconductive layer in an amount effective to limit the intensity of uniform actinic radiation transmitted through said photoconductive layer no greater than about one-third of the intensity of said imagewise configured actinic radiation striking said one side of said photoconductive layer; wherein the amount of uniform actinic radiation absorbed by said photoconductive layer is sufficient to create a space charge limited current within said photoconductive layer.

4,037,933
LIGHT DEFLECTOR OF ACOUSTO-OPTIC INTERACTION TYPE

Tsutomu Yano; Koetsu Saito; Kuniaki Fukaya, all of Kawasaki, and Akinori Watanabe, Komae, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 4, 1975, Ser. No. 637,702
Claims priority, application Japan, Dec. 9, 1974, 49-141793
Int. Cl.[2] G02F 1/16
U.S. Cl. 350—161 W **4 Claims**



1. A light deflector for deflecting an incident beam of light through a predetermined angle comprising:

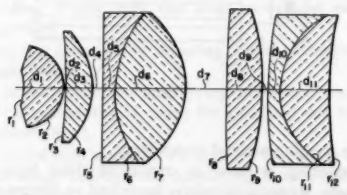
an acousto-optic medium formed of an anisotropic crystal having light incidence and exit surfaces and an acoustic wave incidence surface, said light incidence surface being inclined with respect to the (001) plane of said crystal at an angle which is less than 10°, and said acoustic wave incidence surface being inclined with respect to the (110) plane of said crystal, and

an ultrasonic wave source affixed to said acoustic wave incidence surface for propagating an ultrasonic energy wavefront in said crystal, the direction of the normal to said wavefront being different from the direction of ultrasonic energy propagation in said crystal.

4,037,934
MICROSCOPE OBJECTIVE

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 630,899
Claims priority, application Japan, Nov. 15, 1974, 49-131140
Int. Cl.[2] G02B 21/02
U.S. Cl. 350—175 ML **6 Claims**



1. A microscope objective comprising a front lens group and a rear lens group, said front lens group comprising a first positive lens component having a concave surface positioned toward the object side and made of material having a high refractive index and low dispersion, a second positive meniscus lens component made of low dispersion material and a third cemented lens component having positive power and a cemented surface convex toward the object side and comprising a lens made of low dispersion material, said rear lens group comprising a fourth positive lens component made of low dispersion material and a fifth positive cemented lens component having a rear surface convex toward the object side, said microscope objective satisfying the following conditions:

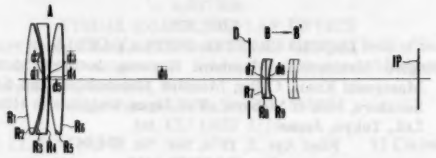
$$n_l > 1.77,\ \nu_l > 49 \quad (1)$$
$$r_a > 0 \quad (2)$$
$$3f < (r_b/n_b - 1) \quad (3)$$
$$5.9 < f_{II}/f_I < 20 \quad (4)$$

wherein reference symbol n_l represents refractive index of the first lens component, reference symbol ν_l denotes Abbe's number of the first lens component, reference symbol r_a designates radius of curvature of one cemented surface of the third lens component, reference symbol r_b represents radius of curvature of the image side surface of the fifth lens component, reference symbol n_b denotes refractive index of the image side lens element of the fifth lens component, and reference symbols f, f_I and f_{II} designate the total focal lengths of the entire lens system, the front lens groups and the rear lens group respectively.

4,037,935
HIGH-SPEED ADJUSTABLE FOCUS TELEPHOTO OBJECTIVE LENS

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,338
Claims priority, application Japan, Sept. 11, 1974, 49-104736
Int. Cl.[2] G02B 13/02
U.S. Cl. 350—176 **11 Claims**



1. A high-speed focus adjustable telephoto objective lens, comprising:

a fixed lens group which has a positive refracting power and has at least one negative lens, said fixed lens group further being fixed at a position separated from the image surface by a prescribed length,

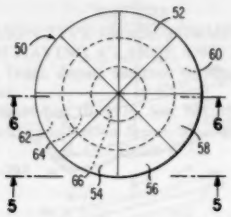
a movable lens group, which has a negative refracting power and has at least one positive element lens and at least one negative element lens, wherein the front surfaces contacting air of these element lenses have their convex planes facing toward an object and the rear faces thereof contacting air have their concave planes facing toward an image, said movable lens group being located at an object side on an axis being separated from said fixed lens group, and the diameters of the element lenses within the movable lens group being smaller than the diameters of the lenses within the fixed lens group,

whereby said movable lens group is shifted toward an object as said telephoto lens is refocused from an object at far distance to an object at close distance.

4,037,936
CORRECTING LENS HAVING TWO EFFECTIVE SURFACES

Albert Maxwell Morrell, Lancaster, Pa., and Dennis Henry Irlbeck, Cranford, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 298,637, Oct. 18, 1972, abandoned.
This application Apr. 5, 1974, Ser. No. 458,356
Int. Cl.[2] G02B *3/02*; G03B *41/00*
U.S. Cl. 350—189 3 Claims



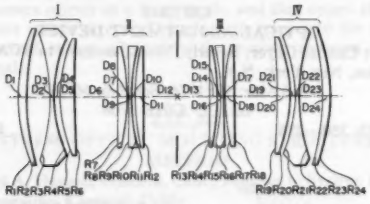
1. A correcting lens for use in the formation of a color picture tube screen comprising,

two effective surfaces on opposite sides of said lens, each surface comprising a plurality of elements separated by boundaries of discontinuity, one of said surfaces having radially extending boundaries of discontinuity and elements on opposite sides of said lens contoured to cooperatively reduce misregister in said tube.

4,037,937
VARIABLE MAGNIFICATION LENS SYSTEM USING SYMMETRIC LENS OF VARIABLE FOCAL LENGTH

Kazuo Minoura, Shirane, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 299,307, Oct. 20, 1972, abandoned.
This application May 3, 1974, Ser. No. 466,601
Claims priority, application Japan, Oct. 22, 1971, 46-83374; Apr. 17, 1972, 47-37668
Int. Cl.[2] G02B *15/16*
U.S. Cl. 350—184 10 Claims

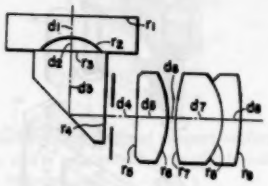


1. In a variable magnification optical system having a central plane of symmetry and adapted to be interposed between a stationary object plane and a stationary image plane axially spaced from the object plane, wherein the system includes first and second pairs of lens groups each symmetrically disposed with respect to the central plane with the second pair being interior of the first pair, the improvement being that the lens groups of the first pair are stationary and the lens group of the second pair are respectively movable axially in symmetrical relation with respect to the central plane, and wherein the lens groups of the first pair are of negative power and the lens groups of the second pair are of opposite power and said two pairs of lens groups including all the lenses betwen the object and image planes and wherein the system is movable as a unit between the object and the image planes.

4,037,938
RETROFOCUS-TYPE OBJECTIVE FOR ENDOSCOPES

Nobuo Yamashita, Tama, and Toshihiro Imai, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Nov. 26, 1975, Ser. No. 635,424
Claims priority, application Japan, Nov. 27, 1974, 49-136922
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—202 13 Claims



1. A retrofocus-type objective for endoscopes comprising a front diverging lens group comprising a lens having negative refractive power and a rear converging lens group comprising a positive lens and a positive cemented doublet lens whose cemented surface has negative refractive power, and said objective satisfying the following conditions:

$$|r_0| > |r_0'| \quad (1)$$

$$0.8 \leqq m \leqq 2.5 \quad (2)$$

$$0.5 \leqq \left| f\{1/f + (n_o - 1)/r_o\} \right| \leqq 1.0 \quad (3)$$

$$0.5 \leqq f/|r_a| \leqq 1.2 \quad (4)$$

wherein the reference symbol m represents the ratio of the total focal length of the rear converging lens group relative to the total focal length of the entire objective system as a whole, the reference symbol f_1 denotes the focal length of the front converging lens group, the reference symbol f designates the total focal length of the objective system as a whole, the reference symbol n_0 represents refractive index of the positive lens located on the object side of the rear converging lens group, the reference symbols r_0 and r_0' denote radii of curvature of the front and rear surfaces respectively of the positive lens located on the object side of the rear converging lens group and the reference symbol r_a designates radius of curvature on the cemented surface of the cemented lens of the rear converging lens group.

4,037,939
VARIABLE FIELD OF VIEW, VARIABLE MAGNIFICATION LENS ASSEMBLY FOR MINIATURE IMAGE VIEWER

William R. Latady, 220 Prospect St., Hingham, Mass. 02043

Continuation-in-part of Ser. No. 559,163, March 17, 1975, and a continuation-in-part of Ser. No. 577,983, May 16, 1975. This application May 19, 1975, Ser. No. 578,411
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—241 2 Claims

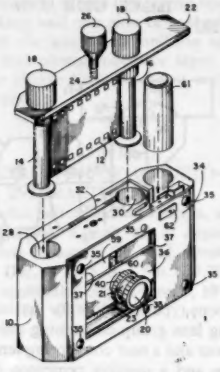
1. A miniature image viewer employing a scannable magnifying lens adapted for viewing images having information of a size not normally discernable to the human eye, said viewer comprising in combination:

a. a housing;

b. means for mounting a planar image within said housing;

c. means for illuminating said image;

d. a variable field of view, variable magnification lens assembly mounted within said housing, said assembly having a variable focal length for viewing at least a portion of said image at a first magnification and for viewing a lesser



portion of said image at a second higher magnification, said assembly comprising a variable magnification zoom lens system; and

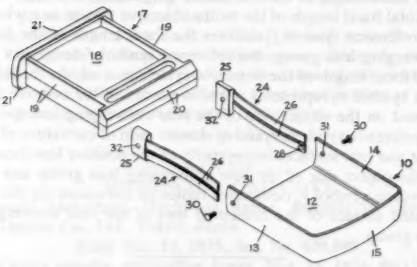
e. lens scanning means arranged to move said lens assembly in a plane to scan the surface of said image.

4,037,940

MAGNIFYING LENS DEVICE

Howard D. Yates, Bradford; James A. Smyth, Wilcox, and Paul A. Hajdu, Bradford, all of Pa., assignors to Zippo Manufacturing Company, Bradford, Pa.

Filed Sept. 15, 1975, Ser. No. 613,211
Int. Cl.² G02B 7/02
U.S. Cl. 350—242 **4 Claims**



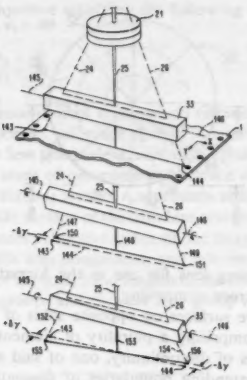
1. In a magnifying lens assembly, an open ended generally rectangular casing, a pair of lens members movable into and out of said casing, and spring means at opposite sides of the interior of said casing for cooperation with said lens members, each of said spring means comprising an integral member including an abutment portion within and adjacent to the open end of said casing and fixed thereto and a pair of spring leaves integral with said abutment portion and extending rearwardly therefrom and bowed laterally toward said lens members, each of said lens members having lateral extensions at its rear end for engagement with said abutment portions to limit outward movement of said lens members and for engaging laterally against said spring leaves to guide and center said lens members into alignment with said casing, said abutment portions being proportioned to provide guideways and centering means for said lens members at the open end of said casing.

4,037,941

INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,329
Int. Cl.² G02B 27/17
U.S. Cl. 350—285 **11 Claims**



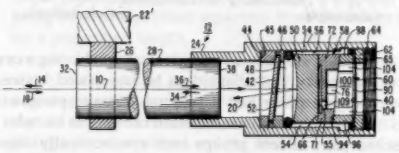
1. An inspection tool comprising: means to feed a workpiece to be inspected into a work zone, said workpiece having a pattern to be inspected; a source of coherent light and means to effect a sweep of said coherent light across said work zone; first light detector means positioned adjacent said work zone to receive light reflected from a workpiece in said zone from said sweep of coherent light; an elongated flexible prism mounted for rotation adjacent said work zone and in the path of said sweep of coherent light, intermediate said work zone and said source of coherent light; first and second actuator means connected respectively to opposite ends of said flexible prism; means to energize at least one of said first and second actuator means to effect rotation of at least said one end of said flexible prism upon said first light detector means detecting misalignment of said workpiece.

4,037,942

OPTICAL ADJUSTMENT DEVICE

Robert Charles Guyer, Beverly, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,413
Int. Cl.² G02B 5/08
U.S. Cl. 350—285 **6 Claims**



1. In combination:

an optical element having an optical axis,

means for mounting the element arranged so that the element can tilt about an axis substantially transverse said optical axis and is restrained from rotating substantially about said optical axis,

first and second wedge members each having a first planar surface tapering toward a second planar surface thereof, said second surfaces having a given spaced relationship when said first surfaces are contiguous, and

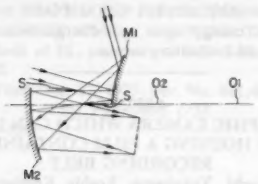
means rotatably mounting said members for wedging said first member between said second member and said element with said first surfaces contiguous, said wedging means and said members being arranged so that each member can rotate with respect to the other member, the rotation of each of said member pivoting the optical axis of said element without rotating the element about the optical axis of said wedge members each including means by which each wedge member can be rotated with respect to the other wedge member.

4,037,943

REFLECTION TYPE IMAGE FORMING OPTICAL SYSTEM HAVING A LARGE ANGLE OF VIEW

Satoru Anzai, Inagi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 557,185
Claims priority, application Japan, Mar. 19, 1974, 49-30547
Int. Cl.[2] G02B *17/06*
U.S. Cl. 350—294 **3 Claims**



1. A reflection type image forming optical system having a large angle of view comprising:

a convex spherical reflecting mirror for reflecting incident light;

a concave spherical reflecting mirror disposed with the reflecting surface thereof facing the reflecting surface of the convex mirror, the concave mirror being arranged so that the distance between the center of curvature of the convex mirror and the center of curvature of the concave mirror is greater than half the radius of curvature of the concave mirror; and

a stop disposed between said reflecting surfaces of the convex and concave mirrors, the stop being arranged to select only light that enters the concave mirror at the large angle with respect to the normal thereof, when reflected by the convex mirror at a large angle, and that enters the concave mirror at a small angle with respect to the normal thereof, when reflected by the convex mirror at a small angle.

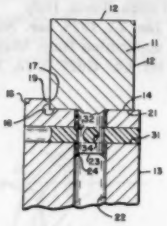
4,037,944

LOW STRESS OPTICAL MOUNTING STRUCTURE AND METHOD

Richard A. Hanson, Concord, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Jan. 23, 1976, Ser. No. 651,721
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—310 **14 Claims**

1. A low stress optical system mounted relative to a mounting surface, comprising an optical element, an optical surface and an element support surface on said optical element, a mounting pedestal adapted to be attached to the mounting surface having a mounting bore therein, a pedestal support surface on said pedestal contacting said element support surface, a mounting post extending from said optical element and passing through said element and pedestal support surface and being loosely received in said mounting bore, said mounting post having a longitudinal axis extending substantially parallel to the axis of said mounting bore, means for registering said optical element relative to said mounting pedestal about said longitudinal axis, and a filler disposed between said mounting bore and said loosely received mounting post, whereby said optical element is positively and rigidly located relative to the



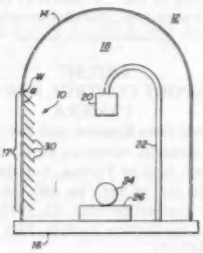
mounting surface by said pedestal support surface and means for registering, and is substantially free of internally generated and externally induced stress.

4,037,945

INDIRECT REFLECTIVE WINDOW

John S. Wollam, 53 Alcott St., Acton, Mass. 01720

Filed Apr. 1, 1975, Ser. No. 564,157
Int. Cl.[2] G02B *5/00*
U.S. Cl. 350—319 **6 Claims**



1. An indirect reflective viewing window for use in a metal-film deposition chamber for providing an unobstructed, indirect, clear and undistorted wide area view of the interior of the chamber and for preventing metal-film deposits from interfering with the reflective viewing of the chamber interior, comprising:

mounting means for attaching to the inside transparent portion of the chamber wall; and

an array carried by said mounting means on the inside of the chamber and including more than two planar reflective elements, each being disposed at an acute first angle to the plane of the window and parallel to each other; each of said reflective elements extending downwardly toward the base of the chamber in overlapping relationship to prevent deposits from forming on the area of the inside surface of the chamber where they are mounted, each of said reflective elements having first and second reflective surfaces for receiving radiation on its first said reflective surface and reflecting it to the second surface of one adjacent said reflective element and for receiving on and reflecting from its said second surface radiation from the first reflective surface of another adjacent reflective element, so that said radiation may then exit the chamber on a path parallel to the incident radiation.

4,037,946
FLEXIBLE BAR FOR SPECTACLE-FRAMES

Oreste Blumenthal, Turin, Italy, assignor to S.p.A. Giuseppe Ratti Industria Ottica, Turin, Italy

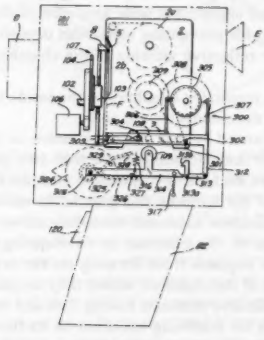
Filed Jan. 22, 1975, Ser. No. 542,957
Claims priority, application Italy, May 28, 1974, 68658/74
Int. Cl.[2] G02C 5/16, 5/18
U.S. Cl. 351—114 8 Claims

1. A flexible element for temples of spectacle-frames, comprising a bar formed of a chain of articulated elements traversed by a deformable longitudinal core arranged to hold them together, in which adjacent articulated elements have similar curved bearing surfaces confronting each other and nesting together for relative movement as the bar is flexed, said articulated elements also having side and end faces defining the girthal periphery of the bar, at least one such articulated element having a shape formed substantially by a portion of a body of revolution defined by surfaces which are obtained by an envelope from a generating plane figure which is made to rotate through an arc about an axis parallel to and spaced from the figure itself, the side and end faces of the articulated elements being unobstructed to permit free movement therebetween during flexing of the bar, said core being deformable to at least flex about axes lying parallel to said axis.

4,037,947
FILM-TRANSPORT CONTROL FOR SOUND-FILM CAMERA

Otto Freudenschuss; Otto Kantner, and Peter Revy von Belvard, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation-in-part of Ser. No. 460,136, April 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,084
Claims priority, application Austria, May 21, 1975, 3906/75; May 24, 1973, 4565/73
Int. Cl.[2] G03B 31/02
U.S. Cl. 352—27 14 Claims



1. In a cine camera, in combination:

a casing adapted to accommodate a perforated motion-picture film having a sound track, said casing being provided with an exposure gate and sound-recording means;

electrically powered drive means in said casing for transporting said film past said exposure gate and said sound-recording means, said drive means including a reciprocable traction claw engageable with the film perforations in the vicinity of said exposure gate and further including a continuously rotatable capstan and a pinch roller adapted to clamp said film therebetween in the vicinity of said sound-recording means;

relatively displaceable support means for said pinch roller and said capstan, said support means including a movable member determining the relative spacing of said pinch roller and said capstan;

biasing means engaging said movable member for urging same from an inactive position into an active position in which the film is clamped between said capstan and said pinch roller;

latch means engageable with said movable member for releasably retaining same in said inactive position;

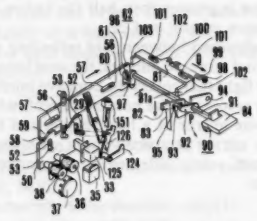
actuating means for energizing said drive means, said latch means being operatively linked with said actuating means for releasing said movable member at the start of a picture-taking operation; and

restoring means coupled with said drive means for re-engaging said movable member with said latch means by residual kinetic energy upon a de-energization of said drive means by said actuating means.

4,037,948
PHOTOGRAPHIC CAMERA WHICH CAN USE A FILM CARTRIDGE HOUSING A FILM CONTAINING SOUND RECORDING BELT

Keiichi Sakaguchi, Yokohama; Yoshio Komine, Tokyo; Toshikazu Ichiyanagi, Tokyo; Mamoru Shimazaki, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,425
Claims priority, application Japan, Apr. 20, 1973, 48-45553; May 7, 1973, 48-50905
Int. Cl.[2] G03B 31/02
U.S. Cl. 352—29 24 Claims



1. A motion picture camera adapted to utilize a film catridge housing a sound signal recording photographic film, comprising:

a cartridge housing chamber to house said cartridge;

a covering for said housing chamber, said cover being movable against said housing chamber to close and open the chamber;

sound signal recording means for recording sound signals on said film, said recording means being adapted to be changed over between a first state to functionally couple with said film for sound recording and a second state to release said coupling with the film for prohibiting sound recording on the film;

change over means to change over said recording means between said first and second states, said change over means being operatively connected with the recording means and operable manually from outside of the camera;

blocking means operatively engaging with said change over means to prohibit operation of said change over means to change over the recording means from the second state to

the first state, said blocking means being movable between a first position to prohibit said operation of the change over means and to a second position to enable said operation of the change over means, said blocking means being shifted by said cover from its first position to its second position when said cover closes said housing chamber;

locking means for locking the cover at a state wherein the housing chamber is closed, said locking means being operatively connected to the change over means to lock the cover in association with operation of the change over means to change over the recording means from its second state to its first state, and to release the locking of the cover in association with operation of the change over means to change cover the recording means from its first state to its second state;

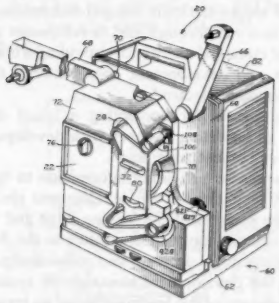
with both the setting of the sound recording and the locking of the cover being effected simultaneously by one operation of the change over means only when the cover is in a state closing the cartridge housing chamber.

4,037,949

SLOT LOAD PROJECTOR

Vincent S. Pasturczak, Chicago, and Melvin T. Kerstein, Lincolnwood, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 17, 1975, Ser. No. 641,495
Int. Cl.[2] G03B *1/58*
U.S. Cl. 352—158 **27 Claims**



1. In a motion picture projector having a frame, a slot for edgewise loading of the film, a feed sprocket, a takeup sprocket, a film gate and a drive means for driving the film through the projector, a multiple position guide means for engaging the film and defining the path of travel thereof, said multiple position guide means comprising:

a manually operable actuator mounted on the frame for moving said guide means between an open position wherein a film strip can be loaded into the projector and a closed position where the film strip is engaged by said film gate and said sprockets;

a pair of loop forming rollers, one on either side of the film gate, said rollers being movable, in response to operation of said actuator, between an open position for engaging the film and forming a loop on either side of said gate and a retracted closed position out of engagement with the film strip;

cam means on the frame for defining the path of travel of the respective rollers; and

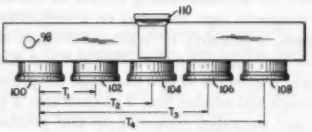
means mounting the feed roller and the takeup roller for movement in an arcuate path of travel, first away from said film strip, then toward said film strip, when moving from said closed to said open positions in response to operation of the actuator, said mounting means including a first mounting plate for each roller, a cam slot in each of said first mounting plates for engagement with said cam means, and a second mounting plate pivotally mounted on the frame, said first mounting plate being pivotally mounted on said second mounting plate for translatory and rotational movement, said second mounting plates being drivingly connected to said actuator whereby the feed roller and takeup roller move in a path defined by said cam means in response to operation of the actuator.

4,037,950

CAMERA FOR TAKING STEREOSCOPIC PICTURES

Allen Kwok Wah Lo, Atlanta, and Jerry Curtis Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Division of Ser. No. 508,810, Sept. 24, 1974, Pat. No. 3,960,563, which is a continuation-in-part of Ser. No. 398,990, Sept. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,796, Sept. 27, 1972, abandoned. This application Mar. 15, 1976, Ser. No. 666,865
Int. Cl.[2] G03B *35/00*
U.S. Cl. 352—58 **6 Claims**



1. In a camera for taking a plurality N of two-dimensional views of an object field for use in composing a stereoscopic picture of the type incorporating a viewing lenticular screen of lenticule width W, the camera including corresponding pluralities N of lenses and associated film frames, the lenses being aligned in a row with their optical axes substantially equidistantly spaced apart and susbstantially in parallel, the improvement comprising:

the distance T between the optical axes of the endmost lenses being related to predetermined values of $X_{T'}$, R, f, a and b generally in accordance with:

$$T = \frac{X_{T'}\, ab}{Rf(b - a)}$$

where

$X_{T'}$ is the total of (1) the parallax value between the image of the nearest foreground element in the object field and the image of the farthest background element in the object field, as formed on the stereoscopic picture from the film frame associated with one endmost lens, and (2) the parallax value between said nearest foreground element image and said farthest background image, as formed on the stereoscopic picture from the film frame associated with the other endmost lens;

a is the distance from the row of lenses to the nearest foreground element in the object field;

b is the distance from the row of lenses to the farthest background element in the object field;

R is the enlargement ratio between the film frames and the stereoscopic picture; and

f is the effective focal length of the camera lenses.

4,037,951

AUDIO-VISUAL CARTRIDGE AND PLAYER

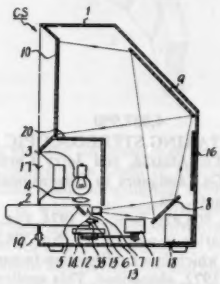
Teiji Aoki, 23-10, Daida-2, Setagaya, Tokyo, Japan

Continuation of Ser. No. 419,871, Nov. 28, 1973, abandoned, which is a division of Ser. No. 342,194, March 16, 1973, Pat. No. 3,844,643. This application July 30, 1975, Ser. No. 600,513

Claims priority, application Japan, Mar. 21, 1972, 47-27466; Apr. 15, 1972, 47-37974; May 20, 1972, 47-59299; June 6, 1972, 47-55671

Int. Cl.[2] G03B *31/06, 23/02*

U.S. Cl. 353—19 4 Claims



1. The combination of a cartridge player and a film cartridge, said film cartridge having two portions separated by a partition wall for accommodating therein an endless film and an endless magnetic tape mounted on a reel, respectively, a driving means, a plurality of windows formed in said film cartridge for exposing said endless film and said magnetic tape therethrough, a reflector in said cartridge for projecting light passing through said endless film, a pivoted arm, a pinch roller located in said cartridge, mounted on said pivoted arm and engageable with said driving means to drive said magnetic tape and said film, and locking means engageable with said film and tape and comprising a projection engageable with the film and comprising a pivoted arm mounted in the cartridge and engaged with said magnetic tape reel when the cartridge is not in said cartridge player and said arm engaged with said cartridge player to move it out of engagement with said reel when the cartridge is in said cartridge player for automatically locking said endless film and magnetic tape so as to maintain synchronization therebetween when the cartridge is removed from the cartridge player and said locking means being released when said cartridge is mounted into said cartridge player, said cartridge player comprising a housing, a screen provided on said housing of said cartridge player and having a longer horizontal dimension than the vertical dimension, an opening formed through said housing in such a manner that when said film cartridge is loaded through said opening into said cartridge player the partition wall of the cartridge is located parallel to the longer dimension of the screen, a light source mounted in said housing for projecting light onto said reflector provided in said film cartridge, optical means mounted in said housing for projecting light from said reflector to said screen to produce an image of said film on said screen, means for guiding said film cartridge into said cartridge player to a driving position, means for releasing said locking means of said film cartridge when said cartridge is mounted into said cartridge player by said guiding means, and film driving means which is held at a predetermined position with respect to said film when said cartridge is not driven, said film driving means and said film pinch roller gripping said film therebetween and driving the film when said film driving means is energized and further including means for locking said cartridge in said machine when said driving means is energized so that the cartridge cannot be removed.

4,037,952

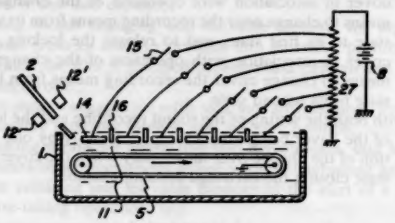
APPARATUS FOR LIQUID DEVELOPMENT OF CUT SHEET ELECTROSTATOGRAPHIC COPIES

Seiji Matsumoto, Tokyo, Japan, assignor to Rank Xerox Ltd., London, England

Division of Ser. No. 393,095, Aug. 30, 1973, Pat. No. 3,951,653. This application Oct. 20, 1975, Ser. No. 623,702

Int. Cl.[2] G03G *15/00, 15/10*

U.S. Cl. 355—3 P 3 Claims



1. An apparatus useful in electrophoretic development of electrostatically imaged discontinuous insulating sheets comprising:

a. a development zone defined by a backing electrode and a development electrode, said development electrode comprising a plurality of individually biased electrodes, each individually biased electrode being separated from the adjacent individually biased electrode by an insulating spacer and said backing electrode being capable of transporting an electrostatically imaged discontinuous insulating sheet into and through said development zone;

b. a source of electrical energy for providing a biasing potential across said development zone between the backing and development electrode;

c. developer means for contacting a latent electrostatic image on an insulating member with developer materials in said development zone; and

d. sensing means for providing information to the individually biased segments of the development electrode concerning the position of the leading edge and the trailing edge of a discontinuous sheet relative to the development zone to sequentially activate said individually biased segments of the development electrode in synchronization with the passage of the leading edge of an insulating sheet through said zone and to sequentially inactivate said individually biased segments of the development electrode in synchronization with the passage of the trailing edge of an insulating sheet through said zone.

4,037,953

CASSETTE LOADING APPARATUS

Yoshiaki Sone, Tokyo, and Masanari Shirai, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,302

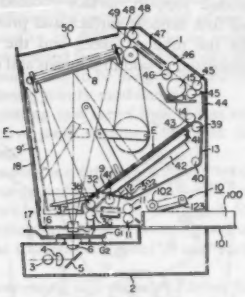
Claims priority, application Japan, Apr. 10, 1975, 50-48733[U]

Int. Cl.[2] G03B *13/28*

U.S. Cl. 355—45 7 Claims

7. A device for observing a micro-image and for reproducing the same, including lens means to enlarge and project the micro-image, a screen to receive the projected micro-image, and means including a copy material advancing device comprising: a cassette for storing a stack of sheets of copy material; means fixed to said apparatus for holding said cassette in a supply position; roller means for feeding said sheet material from said cassette to a copying position; and lifting means disposed on said cassette holding means for lifting said roller means while the cassette is moved toward said supply position, until the center of rotation of said roller means is disposed above the topmost sheet of material in said cassette, wherein

said roller means then rotates in contact with the sheet material and moves into engagement with the topmost sheet in the



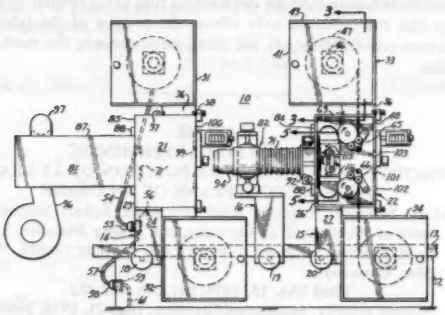
cassette as the cassette is moved further along said path toward its said supply position.

4,037,954

FILM REGISTERING ADVANCING MECHANISM

Harold A. Scheib, Encino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,343
Int. Cl.[2] G03B *27/48, 1/22*
U.S. Cl. 355—50 **11 Claims**



1. In photographic film handling apparatus, the improvement comprising in combination:

means for providing a film aperture located in a plane; and

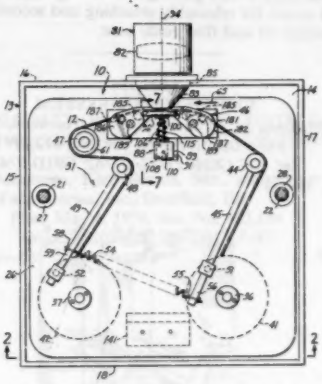
means for transporting photographic film relative to said film aperture, including a film advancing mechanism mounted at said film aperture and including a first element for intermittently advancing said photographic film past said film aperture and a second element for registering said film relative to said film aperture between successive intermittent advancements, a first movable device for mounting said first element, a second movable device for mounting said second element, and means for moving said first and second mounting devices for said intermittent advancement of said photographic film and said registration of said film, respectively, all portions of said first and second elements, of said first and second movable devices and of said means for moving said first and second mounting devices being located outside and to one side of said aperture as seen in a direction extending perpendicularly to said plane.

4,037,955

MICROFILM CAMERA AND PHOTOGRAPHIC FILM HANDLING APPARATUS

John Jamieson, Los Gatos, and Henry F. Price, Laguna Niguel, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 26, 1974, Ser. No. 536,702
Int. Cl.[2] G03B *27/32*
U.S. Cl. 355—54 **6 Claims**



1. In apparatus for handling photographic film having a first format and alternatively photographic film having a second format different from said first format, the improvement comprising in combination:

photographic imaging equipment comprising a first unit including a first photographic lens system and first means operatively associated with said first lens system for defining a first image aperture, and a second unit including a second photographic lens system and second means operatively associated with said second lens system for defining a second image aperture;

means for releasably mounting said first unit and alternatively said second unit;

a film pressure plate operatively associated with said imaging equipment and common to said first aperture defining means and said second aperture defining means for clamping photographic film having said first format and photographic film having said second format alternatively against said first aperture defining means and against said second aperture defining means;

means coupled to said film pressure plate for actuating said film pressure plate relative to said first aperture defining means and alternatively relative to said second aperture defining means;

means connected to said actuating means for mounting said actuating means in a stationary relationship relative to said means for releasably mounting said first unit and alternatively said second unit;

means for advancing photographic film having said first format and alternatively photographic film having said second format past said film pressure plate;

a carriage for mounting said advancing means for movement relative to said film pressure plate and said means for releasably mounting said first unit and alternatively said second unit;

means coupled to said carriage for moving said carriage relative to said film pressure plate and said means for releasably mounting said first unit and alternatively said second unit; and

means for alternatively guiding said advancing film having said first format and said advancing film having said second format in between said film pressure plate and said first aperture defining means and alternatively said second aperture defining means, said guiding means including a

film guide base on said carriage in the vicinity of said film pressure plate and two exchangeable film guide units for guiding, respectively, film having said first format and film having said second format, one of said film guide units comprising first film guide members for guiding film having said first format and means for releasably attaching said first film guide members to said film guide base, and the other of said film guide units comprising second film guide members for guiding film having said second format and means for releasably attaching said second film guide members to said film guide base.

4,037,956

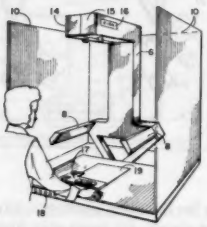
VERIFIED MAIL SYSTEM

Earl S. McKeen, Jr., 61 Jacobsen Drive, Norwood, Mass. 02062

Filed Dec. 19, 1975, Ser. No. 642,299

Int. Cl.[2] **G03B** *27/32, 27/62;* **G01D** *9/42*

U.S. Cl. 355—77 **5 Claims**



1. A method for the verification of mail contents comprising:

receiving of mail contents by a postal employee from a postal customer;

filling out a multipart receipt for said mail contents by said postal employee;

retaining of one part of said multipart receipt by said postal customer for his records;

retaining by said postal employee of the remaining parts of said multipart receipt for Post Office use;

placing one part of said multipart receipt into a tab indicia plate which is placed at the corner of said mail contents to be copied;

copying said mail contents with said tab indicia plate containing said multipart receipt at its corner;

sending said copies of said mail contents to a Central Depository for storage;

retrieving said stored copies at the request of said postal customer;

reproducing copies of said mail contents;

verifying that said copies are true copies of the mail contents originally received by the Post Office from said postal customer; and

mailing said verified copies to said postal customer.

4,037,957

METHOD AND MACHINE FOR THE PRODUCTION OF A SERIGRAPHIC SCREEN BY THE PHOTOCHEMICAL METHOD

Bernard Lallement, Troyes, France, assignor to Vitos Etablissements Vitoux, Aube, France

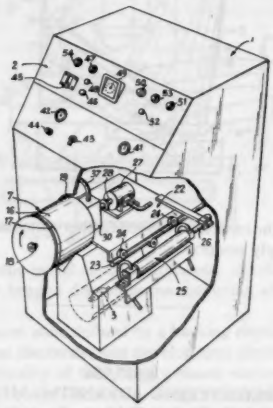
Filed Mar. 25, 1975, Ser. No. 561,889

Claims priority, application France, Apr. 4, 1974, 74.11960; Mar. 14, 1975, 75.08019

Int. Cl.[2] **G03B** *27/20*

U.S. Cl. 355—91 **23 Claims**

1. Machine for the production of a serigraphic screen from a blank tubular shaped woven fabric screen and a tubular masking film having transparent zones and opaque zones and bearing in the opaque zones the design to be printed in ink from the serigraphic screen, wherein the improvement comprises first means for supporting the tubular screen and the tubular masking film in a cylindrical form with the tubular masking film in surface contact with the tubular screen, said first means including a cylindrically shaped first support surface and a cylindrically shaped second support surface located radially outwardly from said first support surface and providing a space therebetween for the tubular screen and the masking film, second means connected to said first means and operable in the



space between said first and second support surfaces for axially and radially stretching the tubular screen and masking film under the conditions of tension to be applied to the finished screen when it is used for printing, and means for directing actinic radiation through the masking film to the tubular screen so that the radiation only affects the portion of the tubular screen corresponding to the transparent zones in the masking film.

4,037,958

APPARATUS FOR DETERMINING PHOTOELECTRICALLY THE POSITION OF AT LEAST ONE FOCUSING PLANE OF AN IMAGE

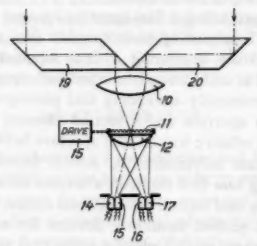
Horst Schmidt, Nauborn; Knut Heitmann; Eckart Schneider, both of Wetzlar, all of Germany, and Walter Mandler, Midland, Canada, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Germany

Filed Oct. 15, 1975, Ser. No. 622,452

Claims priority, application Germany, Dec. 21, 1974, 2460805

Int. Cl.[2] **G01C** *3/08;* **G01J** *1/20*

U.S. Cl. 356—4 **21 Claims**



1. In an apparatus for determining the position of a focusing plane of an image within an optical device comprising: along an optical axis, an optical correlator incorporating imaging optics for imaging an object into an image plane, at least one structure or grating acting as spatial frequency filter and

mounted in or in the vicinity of said image plane of said imaging optics;

further incorporating means for photoelectrically detecting associated with said spatial frequency filter;

means for defining the entrance pupil of said imaging optics into a plurality of different regions being traversed by light fluxes emitted from said object as a set of light fluxes to be measured and to be imaged on said spatial frequency filter for being jointly modulated;

means for splitting said set of light fluxes corresponding to the respective pupil regions into a pair of sets of partial light fluxes;

means for causing a relative movement between said structure or grating and said image of said object;

said means within said optical correlator for photoelectrically detecting further generating electrical output signals in response to respective ones of said partial light fluxes; and

means for processing said signals to drive further electrical signals being indicative of the position of the focusing plane of the image;

the improvement comprising:

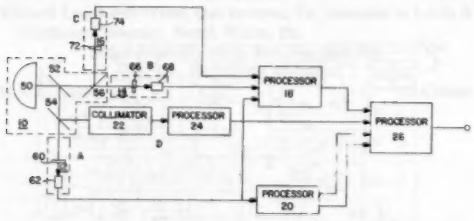
said means for defining the entrance pupil of said imaging system into a plurality of different regions comprising two rhombic prisms **(19,20)** in front of said optical imaging system, each of said prisms being laterally and symmetrically arranged with respect to said optical axis of said optical imaging system for enlarging the distance between the gravity centers of said entrance pupil of said optical imaging system.

4,037,959

MEANS FOR REAL-TIME LASER SOURCE CHARACTERIZATION

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1975, Ser. No. 640,523
Int. Cl.[2] G01J *1/00*
U.S. Cl. 356—73 **5 Claims**



1. A system for analysing beams or rays of monochromatic radiation comprising:

an image collector for incident radiation anywhere from a large area;

beam splitters arranged behind the collector to create at least three optical paths for said radiation;

a plurality of attenuators which are located one in each of the optical paths with one optical path attenuated by a uniform optical filter to provide a reference beam and two other optical paths attenuated by optical filters with linear response which are mounted orthogonally to one another;

a plurality of electro-optical detectors which are placed so that one is at the end of each optical path to intercept the radiation at that point to produce an electrical analog thereof; and

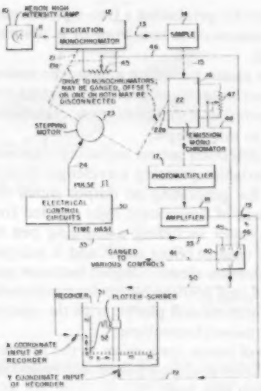
a plurality of processing circuits attached to each output of said detectors for converting the electrical outputs therefrom to a value which is a reasonable display of a selected property of said beam, whereby the point of origin of said radiation is determined, the optical frequency is determined, the pulse width is determined, the power level is determined, and the pulse repetition frequency (PRF) is determined.

4,037,960

DIGITALLY SETTABLE SELECTIVE CONTROL FOR SPEED OF WAVELENGTH SCAN OR FOR TIME BASE SCAN

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 4, 1976, Ser. No. 683,188
Int. Cl.[2] G01N *21/00*; G01J *3/42*
U.S. Cl. 356—73 **7 Claims**



1. In a spectrophotometer adapted to operate over a band of wavelengths:

a recorder having a plotter-scriber for drawing a graph in two coordinates;

means responsive to an optical meausrement made by said spectrophotometer for controlling the position of the plotter-scriber along one coordinate;

said recorder having means for controlling the position of the plotter-scriber along another coordinate in accordance with the value of a signal;

mode selector means for controlling the spectrophotometer to operate in a selected one of different modes;

a common digitally settable means for selecting a desired scan rate;

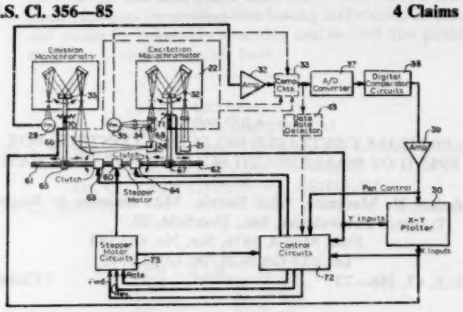
means, under the control of said mode selector means in a first of said different modes, for generating a time base having a rate of rise determined by said common digitally settable means and for supplying said time base to said recorder as said signal;

means, under the control of said mode selector means in a seocnd or said different modes, for scanning the wavelengths to which said spectrophotometer is set at a rate determined by said common digitally settable means, and for producing a voltage, indicative of the wavelength to which the spectrophotometer is set, and for supplying said voltage to said recorder as said signal.

4,037,961
SYSTEM AND APPARATUS FOR CONTOUR PLOTTING THE TOTAL LUMINESCENCE SPECTRUM OF A SAMPLE

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 6, 1976, Ser. No. 702,495
Int. Cl.[2] G01N *21/52*
U.S. Cl. 356—85 4 Claims



1. A system for producing a two-dimensional contour plot of the total luminescence spectrum of a sample comprising, in combination:

excitation means including a monochromator having a variable operating wavelength dependent on applied pulses for generating a source of monochromatic light for application to said sample;

emission detection means including a monochromator having a variable operating wavelength dependent on applied pulses for generating an output signal dependent on the amplitude of flourescent light emitted from said sample;

an X-Y plotter including a marking pen responsive to an applied control effect and X and Y axis positioning means;

synchronization means coupled between said monochromators and said position means for synchronizing the position of said pen on said plotter with the operating wavelength of said monochromators;

pen control means responsive to the presence of a predetermined level at the output of said emission means for actuating said pen; and

scanning means for progressively scanning one of said monochromators through a predetermined range of wavelengths, and for incrementally advancing the other of said monochromators upon the completion of each such scan, to form said desired contour plot.

4,037,962
APPARATUS FOR THE SPECTRAL ANALYSIS OF MATERIALS

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhutte, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,771
Claims priority, application Germany, Mar. 26, 1975, 2513345
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—86 10 Claims

1. An apparatus for spectroscopically analyzing the composition of a workpiece, said apparatus comprising:

a support;

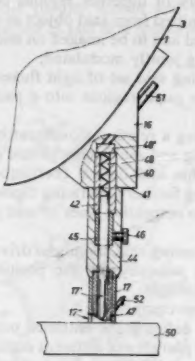
a sleeve mounted on said support and having an open end engageable with a surface of the workpiece and formed with a laterally open cutout;

an electrode on said support and having an electrode tip limitedly displaceable in said sleeve adjacent said open end thereof;

means between said support and said electrode for fixing said electrode in said sleeve with said tip spaced inwardly of said open end thereof;

means connected to said electrode for sparking between said surface and said tip when same are spaced apart and said open end abuts said surface;

optical means on said support directed through said cutout at the space between said tip and said surface and including a primary slit for transmitting into said support the



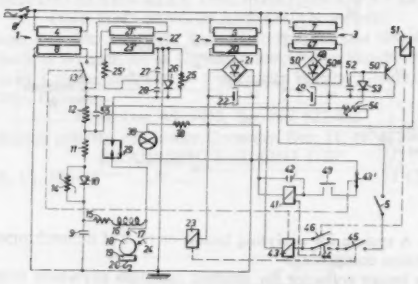
light of a spark in said space between said tip and said surface; and

means in said support including a Rowland grating and a plurality of secondary slits for breaking the light received from said optical means down into an analyzable spectrum.

4,037,963
SPARK-DISCHARGE APPARATUS WITH GROUND DETECTION SAFETY CIRCUIT

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhuette, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,772
Claims priority, application Germany, Mar. 26, 1975, 2513379
Int. Cl.[2] G03B *27/04*
U.S. Cl. 356—86 10 Claims



1. A spark discharge apparatus for testing the composition of a conductive workpiece, said apparatus comprising a holder electrode conductively engageable with said workpiece; a counter electrode adapted to be spaced by a gap from said workpiece while same is in contact with said holder electrode; sparking means including a closable switch and connected across said electrodes for passing a unipolar electrical pulse across said gap only when said switch is closed; and circuit means including a terminal connectable to said workpiece and an electrical connection to said holder electrode, said circuit means being connected to said switch for closing same only on detection of a closed circuit between said terminal and said holder electrode, whereby said sparking means can only pass said pulse when said terminal is in electrical contact with said workpiece and said workpiece is in electrical contact with said

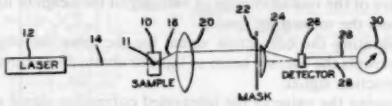
holder electrode and by this the operator and the workpiece are on the same potential.

4,037,964

METHOD AND APPARATUS FOR MEASURING THE SUM OF THE RADII OF PARTICLES IN A COLLECTION

Alan Lee Wertheimer, North Wales, and Frederick Lee Williams, Lansdale, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Jan. 15, 1976, Ser. No. 649,754
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—102 3 Claims



2. Apparatus for measuring the sum of the radii of the individual particles of a collection of particles comprising:

means for directing a light beam at said collection of particles,

a filter for filtering the light diffracted from said beam by the particles of said collection, said filter having a filter function which varies between approximately 1.3 and 1.6 as the distance from the axis of said beam increases so that the magnitude of the total light flux transmitted is proportional to said sum, and

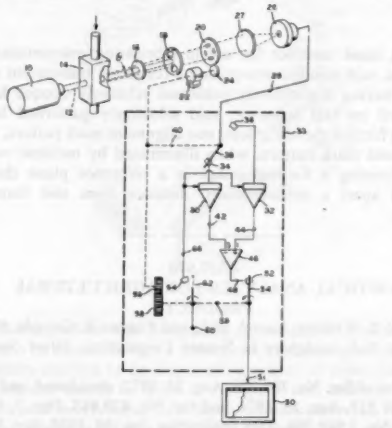
means for detecting the magnitude of the total light flux transmitted by said filter as a measure of said sum.

4,037,965

METHOD AND OPTICAL MEANS FOR DETERMINING DIMENSIONAL CHARACTERISTICS OF THE PARTICLE DISTRIBUTION IN A COLLECTION OF PARTICLES

Edward Leonhardt Weiss, Quakertown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Mar. 23, 1976, Ser. No. 669,788
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—102 12 Claims



7. Apparatus for improving the measurement in a collection of particles of the moments of the particle distribution by number comprising,

means for passing a light beam through said collection,

means operable to measure the total of the low-angle, forward-scattered light flux from the particles,

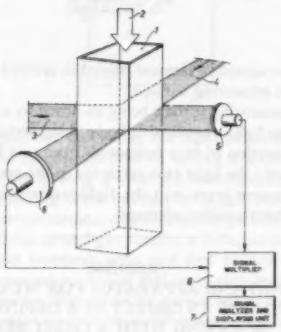
means for modulating the response of said measurement as a function of the angle of diffraction of the flux being measured so that the response to the flux diffracted by each particle in said light beam is such that the total flux measured is proportional to the desired moment, said modulating function having a range of values such that through the span of diffraction angles over which said response is modulated the function has a positive value for a part of the span including the smallest angle and a negative value for a part of the span adjacent the part of the span including the smallest angle.

4,037,966

METHOD AND DEVICE FOR EXAMINING PULP FOR THE PRESENCE OF SHIVES

Jan Hill, Taby, Sweden, assignor to AB Tellusond, Stockholm, Sweden

Filed May 12, 1976, Ser. No. 685,924
Claims priority, application Sweden, May 14, 1975, 7505539
Int. Cl.[2] G01N *21/26*
U.S. Cl. 356—102 12 Claims



1. A method of examining pulp for the presence of shives therein, comprising the steps of passing a suspension of the pulp through a measuring duct with transparent walls, directing two mutually perpendicular beams of light through the measuring duct in a common plane perpendicular to the direction of the flow in the measuring duct, measuring the intensities of said two light beams after their passage through the measuring duct by means of two photo detectors, multiplying the output signals of said two photo detectors so as to provide a combined signal representing the product of the output signals of the photo detectors, and analyzing this combined signal with respect to amplitude variations ocurring therein.

4,037,967

APPARATUS FOR MEASURING THE DENSITY OF A LIQUID, UTILIZING THE LAW OF REFRACTION

Walter Schweizer, Berlin, and Martin-Ulrich Reissland, Gummersbach, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Apr. 29, 1974, Ser. No. 465,241
Claims priority, application Germany, May 14, 1973, 2324259
Int. Cl.[2] G01N *21/46*
U.S. Cl. 356—135 13 Claims

1. Apparatus for continuously measuring the density of a liquid within predetermined limits by use of the law of refraction, said apparatus being particularly useful for measuring the density of the electrolytic acid in a motor vehicle storage battery in order to determine its state of charge, comprising:

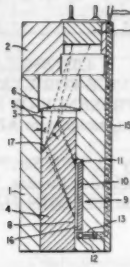
A. a light-transmissive body having a measuring surface thereon,

B. a plate of frosted light-transmissive material comprising at

least one frosted surface and at least one edge, the frosted surface being mounted in a position facing the measuring surface and spaced therefrom,

C. a lamp for directing light into the edge of said plate to cause the frosted surface to function as an illuminating surface of a light source with non-directional light transmissive characteristics,

D. the illuminating surface and the measuring surface defining walls of an open chamber which is filled with the liquid, and



E. a photosensitive element placed to receive light deflected by the measuring surface,

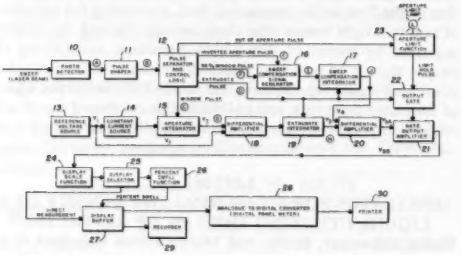
F. said measuring surface being enclosed by an opaque layer, and the light-transmissive body being arranged relative to the direction of rays emanating from said light source, so that only the light rays refracted in the area of the end of the opaque layer into the light-transmissive body strike the photosensitive element.

4,037,968

METHOD AND APPARATUS FOR MEASURING A DIMENSION OF AN OBJECT IN A DEFINED SPACE BY SCANNING WITH A LIGHT BEAM

David P. King, Akron, and Robert I. Barker, Cuyahoga Falls, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 642,705
Int. Cl.[2] G01B *11/04, 11/10*
U.S. Cl. 356—160 **11 Claims**



1. A method of measuring the width of a continuous object between two of its edges which comprises:

a. placing the object between the edges of a measuring space,

b. scanning the measuring space and object between the edges thereof by means of a narrow beam of light through a rotating prism so that a beam of parallel light crosses one of the edges of the measuring space in the nonilluminated to illuminated direction and one of the edges of object in the illuminated to nonilluminated direction and crosses the other edge of the object in the nonilluminated to illuminated direction and the other edge of the measuring space in the illuminated to nonilluminated direction,

c. detecting the narrow beam of light passing through the measuring space,

d. generating an electrical analogue signal proportional to the time of scanning of measuring space

e. generating an electrical analogue signal proportional to the time the object interrupts the narrow beam of light

f. integrating a constant signal for said time of scanning the measuring space to obtain a signal proportional to the average speed of rotating the prism,

g. integrating said signal proportional to the average speed of rotating the prism for the time the object interrupts the narrow beam of light to obtain signal proportional to the uncorrected width of the object,

h. generating an electrical analogue correction signal in synchronization with the analogue signal of (d) representative of the rate of change of velocity of the beam of light across the measuring space,

i. integrating the correction signal for the time the object interrupts the narrow beam of light to obtain an integrated correction signal,

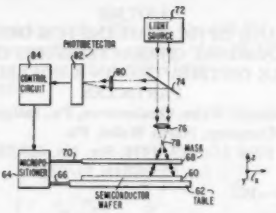
j. summing the value of the integrated correction signal and the signal proportional to the uncorrected width of the object to provide a composite signal representative of the width of the object independent of its position in the measuring space.

4,037,969

ZONE PLATE ALIGNMENT MARKS

Martin Feldman, Murray Hill, and Alan David White, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1976, Ser. No. 673,126
Int. Cl.[2] G01B *11/26*
U.S. Cl. 356—172 **12 Claims**



1. A mask member for use in fabricating microminiature devices, said member comprising a relatively transparent substrate having a selectively patterned relatively opaque layer disposed on said substrate, said selectively patterned layer having formed therein at least one alignment mark pattern, said alignment mark pattern, when illuminated by incident radiation, forming a focused image in a reference plane that is spaced apart a predetermined distance from said forming means.

4,037,970

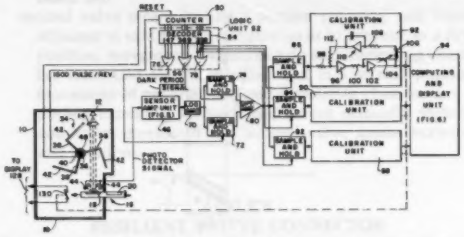
OPTICAL ANALYZER FOR AGRICULTURAL PRODUCTS

Donald R. Webster, Laurel, Md., and Eugene R. Ganssle, Skillman, N.J., assignors to Neotec Corporation, Silver Spring, Md.

Division of Ser. No. 283,270, Aug. 24, 1972, abandoned, and Ser. No. 497,727, Aug. 15, 1974, and Ser. No. 420,863, Dec. 3, 1973, Pat. No. 3,861,788. This application Jan. 30, 1976, Ser. No. 653,848
Int. Cl.[2] G01J *3/48*
U.S. Cl. 356—188 **16 Claims**

1. Optical apparatus, comprising a source of wide band light for illuminating an object, a multiple filter assembly having a

rotatable axle and a plurality of narrow bandwidth optical interference filters fixed to said axle and radiating therefrom at the same axial location in respective planes forming therewith a paddlewheel configuration, said filter assembly being positioned relative to the light path defined between said light source and the object such that said filters are swept through said light path individually during rotation of said axle, said wide band light impinging on each successive one of said filters as the orientation thereof relative to said light path is changing,



whereby light passing through each one of said filters is restricted to continuously shifting bandwidths as a function of the instantaneous angle between said light path and a given filter during rotation, photosensitive means positioned to receive light from said source of light after passing through one of said filters and coming into optical contact with said object and to produce a signal representative of the level of light received, and means responsive to said signal to provide an indication of a characteristic of said object.

4,037,971

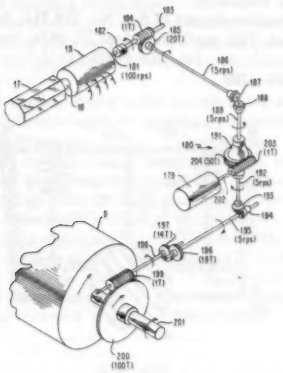
INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,320

Int. Cl.[2] G02B *27/17*

U.S. Cl. 356—199 **14 Claims**



1. An inspection tool comprising: first means to feed a workpiece to be inspected into a work zone, said workpiece having a pattern thereon to be inspected; a source of coherent light and second means to effect a sweep of said coherent light across said work zone; first drive means connected to said second means to effect said sweep; a gear train connected to said first drive means and said first means to effect synchronous operation of said first and second means; a differential gear system in said gear train intermediate said first and second means; and a second drive means connected to said differential gear system whereby upon actuation of said second drive means variations in the speed of said first means may be obtained.

4,037,972

MEASURING APPARATUS

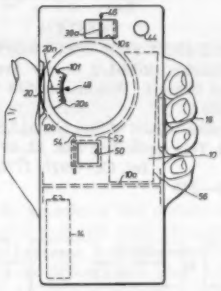
Wilhelm Pross, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Oct. 6, 1975, Ser. No. 619,915

Claims priority, application Germany, Oct. 9, 1974, 2448206

Int. Cl.[2] G01N *21/22*

U.S. Cl. 356—206 **8 Claims**



1. An apparatus for measuring the light permeability of a measuring liquid for the purpose of testing a substance contained therein, comprising a first photoelectric element arranged in a measuring beam emitted by a light source and a second photoelectric element disposed in the path of a comparison beam from the same light source, a differential amplifier having two input terminals with said first photoelectric element being connected to one of said input terminals and said second photoelectric element being connected to the other of said input terminals, an indicator instrument connected to an output terminal of said differential amplifier, and a switch operated electronic regulating system connected to one of said input terminals of said differential amplifier and coming into operation on actuation of said switch for adjusting **(1)** the voltages set up at the two input terminals of said differential amplifier to the same potential and **(2)** the voltage applied to said output terminal connected to said indicator instrument to zero.

4,037,973

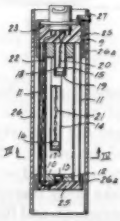
LIGHT SENSITIVE DEVICE FOR MEASURING PARTICLES IN A LIQUID

Larry R. Carr, West Chicago, Ill., assignor to Optronix Inc., West Chicago, Ill.

Filed Nov. 26, 1975, Ser. No. 635,279

Int. Cl.[2] G01N *21/26*

U.S. Cl. 356—206 **15 Claims**



1. A sensing unit for suspended solids measurements and the

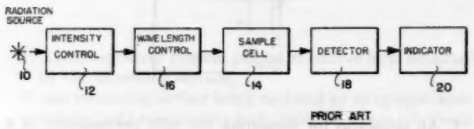
like, comprising a single light source, a pair of photo detectors disposed on substantially a common light path of said source at different distances with respect thereto, with the liquid to be measured adapted to be disposed therebetween, means for supporting said source and detectors in fixed relation and in sealed relation with respect to the liquid to be measured, conductor means operatively connected to said source and detectors for connecting the same in an operative measuring circuit, and tubular opaque shield means cooperable with said supporting means to define a fluid chamber containing said source and detectors, said fluid chamber being provided at opposite ends of said tubular shield means with passageways for the ingress and egress of liquid relative to said fluid chamber.

4,037,974

SAMPLE CELL FOR SPECTROPHOTOMETERS

Taylor C. Fletcher, 2650-1/2 Cherry Ave., Long Beach, Calif. 90806, and Bruce L. Wilkinson, 5518 Norton St., Torrance, Calif. 90503

Continuation-in-part of Ser. No. 515,500, Oct. 17, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,177
Int. Cl.[2] G01N *1/10*
U.S. Cl. 356—246 **6 Claims**



PRIOR ART

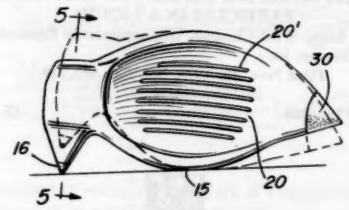
1. A sample cell constructed of a single homogeneous material for use in spectrophotometers having an entrance end and an exit end through which a beam of radiation enters and leaves the cell and passes through a sample contained in the cell, the cell having a transparent side wall, a first window at the entrance end integral with said side wall and of the same material as said side wall, a second window at the exit end integral with said side wall and of the same material as said side wall , and said side wall including means for minimizing the passage of the radiation through said side wall from the entrance end to the exit end of the cell so as to obviate the formation of a light pipe by said side wall.

4,037,975

WRITING INSTRUMENT

Fred A. Huffman, P.O. Box 1319, Rawlins, Wyo. 82301

Filed May 4, 1976, Ser. No. 683,198
Int. Cl.[2] B43K *7/00*
U.S. Cl. 401—6 **11 Claims**



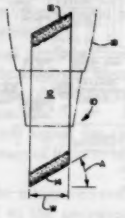
10. A writing instrument in the shape of a bird comprising; body means so shaped as to form a pleasant hand engaging structure for convenient use by a writer, a writing implement at the beak position of the head of the bird-like instrument, a lower body portion means shaped so as to form a pivot point for rotating the bird-like body thereabout for convenient and pleasant use of said instrument, and further means of permitting a magnified pressure on the writing implement when the body means is rotated about said pivot point.

4,037,976

WRITING NIB STRUCTURE AND METHOD OF MANUFACTURE

John E. McDaniel, Douglasville, and Harold B. Morris, Newman, both of Ga., assignors to Glasrock Products, Inc., Fairburn, Ga.

Division of Ser. No. 586,593, June 13, 1975, abandoned. This application Mar. 2, 1976, Ser. No. 663,220
Int. Cl.[2] B43K *1/00*
U.S. Cl. 401—198 **11 Claims**



1. The method of forming writing nibs comprising the steps of:

forming layers of relatively rigid material on opposite surfaces of a strip of wicking material thereby to provide a laminated strip in which said wicking material extends between and is exposed on opposite edges of said laminated strip;

shaping at least one edge of said laminated strip so that said wicking material projects beyond said layers of relatively rigid material at said edge; and

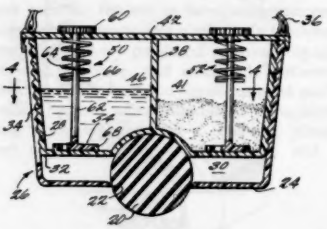
severing said laminated strip transversely at longitudinal increments to provide writing nibs of a length corresponding to the transverse dimension of said laminated strip.

4,037,977

MASSAGE AND DISPENSING APPARATUS

Anne A. Ronai, c/o Thomas Ronai, Hideca, Apartado, 68658 Caracas, Venezuela

Continuation-in-part of Ser. No. 539,712, Jan. 9, 1975, abandoned. This application Jan. 27, 1976, Ser. No. 652,857
Int. Cl.[2] A45D *33/12*
U.S. Cl. 401—209 **11 Claims**



1. A massager and dispenser apparatus comprising:

a housing having an open top and a bottom surface with an aperture extending therethrough,

an applicator ball extending partially through said aperture,

an insert member disposed in said housing for holding said applicator ball in a dispensing position, forming a dispensing chamber between said housing bottom and said insert and forming first and second storage chambers above said dispensing chamber, said insert having at least first and second apertures therein connecting first and second chambers respectively to said dispensing chamber,

a lid member closing the top of said housing and said first and second chambers,

first valve means having a valve portion engaging said insert adjacent said first aperture so as to prevent, in a first position, movement of material into said dispensing chamber from said first chamber and to permit, in a second position, movement of material into said dispensing chamber and a knob portion extending through said lid for manually shifting said valve portion between said positions, and

second valve means having a portion engaging said insert adjacent to said second aperture so as to prevent, in a first position, movement of material into said dispensing chamber from said second chamber and in a second position movement of material into said dispensing chamber and a portion extending through said lid for manually shifting said valve portion of said second valve means between said positions.

4,037,978

RESILIENT SWIVEL CONNECTOR

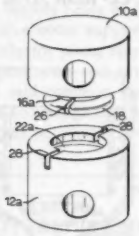
Brian W. Connelly, Toronto, Canada, assignor to B.C. Investments Ltd., St. Helier, Guernsey (Channel Is.)

Filed Aug. 14, 1975, Ser. No. 604,715

Claims priority, application United Kingdom, Aug. 23, 1974, 37200/74; Dec. 16, 1974, 54283/74

Int. Cl.[2] F16D *1/12*

U.S. Cl. 403—164 **3 Claims**



1. A swivel coupling comprising:

a first resilient portion and a second resilient portion, the first portion being solid except for a first bore provided therethrough for grippingly receiving a cylindrical elongated member,

the second portion being solid except for a second bore provided therethrough for grippingly receiving an elongated member,

each portion defining a slot having a width less than the diameter of its respective bore, the slot being aligned with and extending radially from its respective bore and extending to the outer surface of the respective portion,

and interlocking engagement means for pivotally connecting the first portion to the second portion such that each portion is rotatable with respect to the other about an axis which is substantially perpendicular to elongated members when received in the respective bores.

4,037,979

ANCHORING ARRANGEMENT, ESPECIALLY FOR PRE-STRESSED CONCRETE CONSTRUCTIONS

Werner Fastenau, Esslingen-Rudern, Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart, Germany

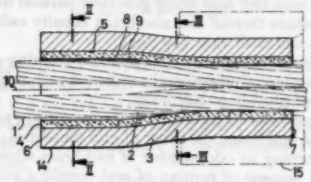
Filed Apr. 24, 1975, Ser. No. 571,207

Claims priority, application Germany, Apr. 24, 1974, 2419628

Int. Cl.[2] B25G *3/28*

U.S. Cl. 403—284 **5 Claims**

1. An anchoring arrangement, especially for pre-stressed concrete constructions, for the anchoring of reinforcing means in the form of ropes, cables, wires and rods, which includes in combination: an outer sleeve of cold-compressible deformable soft steel, a prefabricated intermediate layer, arranged within and in contact with said outer sleeve, said prefabricated intermediate layer consisting of hard steel granular material with the granules of hard steel thereof densely arranged therewith and also consisting of a binding substance for said hard steel granules embedded therein, said prefabricated intermediate layer defining a hollow central space extending in the axial direction of said outer sleeve, and reinforcing means arranged within and substantially filling said hollow space while being in tight radially compressed engagement with said prefabricated



intermediate layer, the granules of said prefabricated intermediate layer being harder than said reinforcing means and said sleeve and originally having at least substantially the form of the central hollow space between said outer sleeve and said reinforcing means, said hard steel granules during deformation of said outer sleeve pressing into said reinforcing means and said sleeve, said granules substantially filling the space between said reinforcing means and sleeve and in contact with each other through said space with the binding substance in the interstices between the particles, whereby the granules transfer the force directly from the reinforcing means to the sleeve.

4,037,980

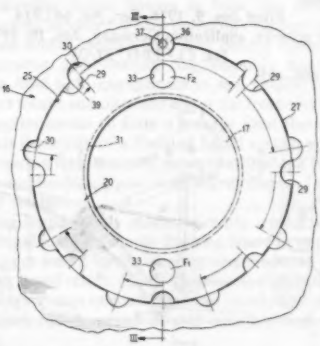
PUMP COUPLING

Walter D. Haentjens, Box 121, R.D. No. 1, Sugarloaf, Pa. 18249

Filed Dec. 24, 1975, Ser. No. 644,300

Int. Cl.[2] F16B *1/00*

U.S. Cl. 403—336 **6 Claims**



1. A coupling assembly comprising:

a power input shaft and a coaxial power output shaft with opposed respective ends,

one of said shafts having a circumferential terminal threaded end,

first coupling means positionable on the end of said one shaft,

a nut-receiving recess defined in the forward face of said first coupling means, said recess having said wall portions located generally in radially equally spaced relationship to the axis of said shafts, in the region of said terminal threaded end,

a cylindrical coupling nut having an axial bore provided with complimentary threads, said coupling nut engaging said terminal threaded end and being receivable within said recess with the outside radius of said coupling nut approaching the radius of said recess,

said recess additionally having a first plurality of half holes defined at circumferentially equally spaced intervals in said side wall portions, the axis of each such half hold being generally parallel to the axes of the other thereof, and also being equally radially spaced from said shaft axis,

said coupling nut additionally having a second pluality of half holes defined at circumferentially equally spaced intervals in the cylindrical outer wall thereof, the axis of each such half hole being generally parallel to the axes of the others thereof and also being equally radially spaced from said shaft axis,

the radius of each half hole in said first plurality of half holes being generally equal to the radius of each half hole in said second plurlity of half holes,

one of said pluralities of half holes comprising an even number of half holes, the other of said pluralities of half holes comprising an odd number of half holes whereby a minimum amount of turning of said coupling nut relative to said one shaft when one end face of said coupling nut is engaged with bottom facial portion of said recess is required to align one half hole of said first plurality of half holes with one half hole of said second plurality of half holes thereby to define a cylindrical channel, comprised of two registering half holes,

locking pin means slidably mounting in said channel,

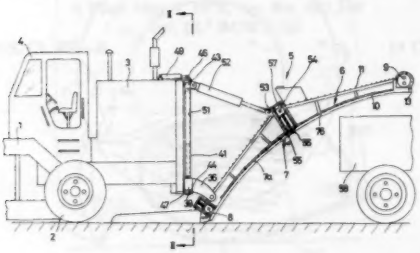
second coupling means engaged with the other of said shafts at such opposed end thereof, including shaft engaging means therefor, said second coupling means having a forward face in abutting and mating relationship with said forward face of said first coupling means, and overlying said locking pin means, and

retaining means holding said first coupling means in rigid engagement with said second coupling means.

4,037,981
MACHINE FOR CUTTING AWAY OR PEELING OFF ROAD SURFACES

Reinhard Wirtgen, Hohner Strasse, 5461 Windhagen, Linz, Germany

Filed Jan. 9, 1976, Ser. No. 647,914
Claims priority, application Germany, Jan. 10, 1975, 2500861
Int. Cl.[2] E01C *23/08*
U.S. Cl. 404—91 **16 Claims**

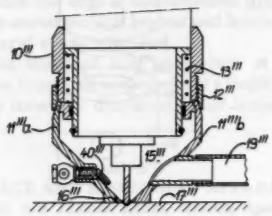


1. A machine for cutting away or peeling off road surfaces comprising a preferably self-propelled chassis on wheels which includes a cutting or peeling device and a conveyor machinery for transporting the cut away or peeled off material from the road level to a level suitable for the transfer into a collecting container, a truck, a trailer, or the like, said conveyor machinery being tilingly hinged, at one of its ends, to said chassis around a substantially perpendicular axis and lockably as well as vertically adjustably pivoted both in an operating position, in which the other of its ends extends backward beyond a plane defined by said chassis and said wheels, and in a rest position, in which said conveyor machinery resides substantially within a space defined by said chassis, said wheels, and other structural parts, wherein said conveyor machinery is secured at one of its ends to a support having bushes at its two ends which are vertically adjustably arranged on two guide spars and said two guide spars together with two crossbars secured to the ends thereof constituting a frame which is hinged for swivelling around the axis of one of said guide spars on said chassis and which is releasably connected with said chassis within the range of the other of said guide spars.

4,037,982
MACHINE TOOLS

Gilbert-Louis Clement, Semeac, France, assignor to Infranor S.A., Switzerland

Continuation-in-part of Ser. No. 504,991, Sept. 11, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,793
Claims priority, application Switzerland, Sept. 9, 1975, 11686/75; Sept. 9, 1975, 11686/75
Int. Cl.[2] B23B *51/06, 47/34*
U.S. Cl. 408—61 **16 Claims**



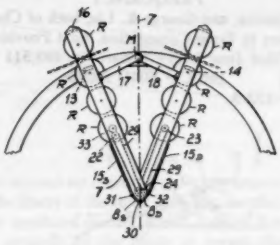
1. A machine tool comprising, a hollow cylindrical body, a rotary driven tool mounted within said body for axial movement in use towards and away from a work surface, a suction chamber disposed about said tool and having means defining a central aperture for passage of the tool and a forward abutment surface for abutment against the work surface, means mounting said chamber for axial movement relative to said body and said tool, means resiliently biasing said chamber in a direction corresponding to a direction towards the work surface, stop means defining a forwardmost position of said chamber relative to said tool, said suction chamber comprising a plurality of complementary chamber sections each extending about a given portion of the circumferential extent of said chamber, means removably securing said chamber sections together and to said mounting means to allow removal of said chamber sections from said mounting means by a generally radial outward movement of said sections relative to said tool, said mounting means including an annular member mounted for axial movement relative to said body and said tool and subjected to the action of said biasing means, said annular member having an externally screw-threaded outer face and a lower edge with an outwardly-facing circular groove, said chamber sections when assembled having a circular upper edge with an inwardly-directed circular flange which rests in said groove of the annular member, and a screw ring threadably engaged on said outer face of the annular member, said screw ringn having a non-threaded clamping portion engageable about said upper edge of said chamber sections.

4,037,983

WIND MOTOR

Rolando Poeta, Viale Certosa, 45, Milan, Italy

Filed Mar. 30, 1976, Ser. No. 671,864
Claims priority, application Italy, Apr. 7, 1975, 22027/75
Int. Cl.[2] F03D *3/04, 7/06*
U.S. Cl. 415—2 **1 Claim**



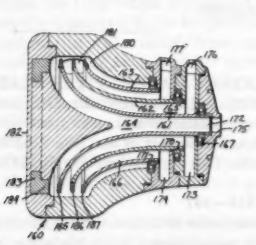
1. A wind motor comprising a pair of horizontally disposed rotor support arms each having one end thereof pivotally mounted about a common vertical axis, two batteries of rotors each battery being respectively supported by one of said rotor support arms, each rotor battery including a plurality of rotors and each rotor comprising a series of elongated vertically extending blades arranged about a vertical rotor axis, the plurality of rotors in each battery being arranged in tandem fashion along their respective rotor support arm, and a pair of vertically extending deflector plates respectively mounted on said pair of rotor support arms and extending between said batteries of rotors and said common vertical axis, said rotor arms being positionable to arrange said batteries of rotors in a "V" formation which may be pointed into the wind to extract useful power therefrom.

4,037,984

PUMPING APPARATUS AND PROCESS CHARACTERIZED BY GENTLE OPERATION

Edson Howard Rafferty, Excelsior, and Harold D. Kletschka, Minneapolis, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Division of Ser. No. 546,770, Feb. 3, 1975, Pat. No. 3,957,389, which is a continuation-in-part of Ser. No. 414,225, Nov. 9, 1974, Pat. No. 3,864,055, which is a continuation-in-part of Ser. No. 204,980, Dec. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 886,137, Dec. 18, 1969, Pat. No. 3,647,324, which is a continuation-in-part of Ser. No. 678,265, Oct. 26, 1967, Pat. No. 3,487,784. This application Mar. 15, 1976, Ser. No. 666,745
Int. Cl.[2] F01B *1/36, 13/00*
U.S. Cl. 415—60 **11 Claims**



1. Apparatus for pumping biological fluids without causing significant damage thereto, comprising, in combination:

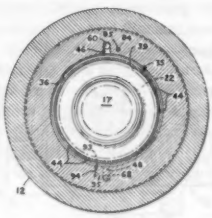
1. means dividing the fluid to be pumped into a plurality of independent streams;
2. means for accelerating the several streams by superficial contact with smooth accelerator members, including
   a. a plurality of nested, coaxial rotators arranged to define walls of a plurality of pumping passages extending along the common axis and increasing in mean diameter with distance along the axis,
   b. means separately mounting said rotators for rotation about said axis,
   c. means supplying said streams to said passages at the smaller diameter ends thereof,
   d. means driving said rotators independently at predetermined angular velocities which may be the same; and
3. means combining the outputs of the several passages to comprise the principal output of the apparatus.

4,037,985

FLUSHING LIQUID SYSTEM FOR THE WEARING RING IN CENTRIFUGAL PUMPS AND THE WEARING RING ASSEMBLY AND WEARING RING FOR USE THEREIN

Igor J. Karassik, Maplewood, and Charles H. Thaw, Morristown, both of N.J., assignors to Worthington Pump, Inc., Moutainside, N.J.

Filed May 20, 1976, Ser. No. 688,156
Int. Cl.[2] F01D *11/00;* **F04D** *29/08;* **F01D** *11/08*
U.S. Cl. 415—175 **11 Claims**



1. In a centrifugal pump forming a pumping chamber therein having a suction inlet and a discharge outlet, a support member in said centrifugal pump disposed between said suction inlet and discharge outlet and having a central opening therethrough, impeller means having at least one front shroud means rotatably mounted in said pumping chamber so that the front shroud means extends into said central opening in the support member, and wearing ring assembly means fixedly mounted in fluid tight engagement in said central opening in said support means and disposed about the front shroud means of said impeller means to form a leakage joint therewith, the combination therewith of a flushing liquid system wherein:

a. said wearing ring assembly means has flushing liquid inlet means and flushing liquid outlet means disposed thereon in spaced relation,
b. flushing liquid supply means operably connected to said centrifugal pump to supply flushing liquid to said flushing liquid inlet means in the wearing ring assembly means,
c. flushing liquid return means operatively connected to said centrifugal pump to drain flushing liquid from said flushing liquid outlet means in said wearing ring assembly means,
d. a first control means to control the pressure at which said flushing liquid is supplied by said flushing liquid supply means to said flushing liquid inlet means in said wearing ring assembly means,
e. a second control means to control the pressure at which said flushing liquid is drained from said flushing liquid outlet means in the wearing ring assembly means, and
f. said first control means and said second control means operative and responsive to at least one operating condition of said pump whereby some portion of the flushing liquid supplied to said wearing ring assembly means through said flushing liquid inlet means will be drained

through said flushing liquid outlet means to minimize the flushing liquid requirements of said pump and to reduce dilution by the flushing liquid of the process fluid or other mixture being pumped by the centrifugal pump.

2. In the combination as claimed in claim 1 wherein said wearing ring assembly means includes,

a. a wearing ring,

b. said wearing ring having a first annular groove on the outer annulus thereof to define at least in part said flushing liquid inlet means,

c. means in said wearing ring for connecting said first annular groove with said leakage joint,

d. said wearing ring having a second annular groove on the outer annulus thereof spaced axially from said first annular groove and defining at least in part said flushing liquid outlet chamber, and

e. second means in said wearing ring connecting said annular groove with said leakage joint.

4,037,986

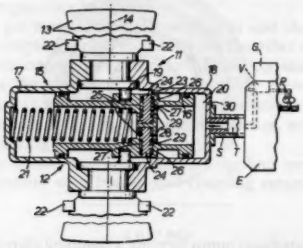
BLADED ROTORS HAVING CONTROL MEANS FOR EFFECTING BLADE PITCH ADJUSTMENT

John Alfred Chilman, Stroud, England, assignor to Dowty Rotol Limited, Gloucester, England

Filed Sept. 4, 1975, Ser. No. 610,376

Int. Cl.[2] B64C *11/40*

U.S. Cl. 416—46 **10 Claims**



1. A bladed rotor including a hub and adjustable blades carried by the hub, said hub having control means, for effecting pitch-adjustment of said blades, which comprises an actuator and connecting means for operably connecting the actuator to the blades, said actuator comprising two co-operable and relatively-movable components, biassing means urging one of said components in one direction toward one end-of-stroke-defining position for adjusting pitch in one sense, fluid pressure means for moving said one component in the opposite direction toward the other end-of-stroke-defining position, against the action of said biasing means, for adjusting pitch in the other sense, stop means which are carried by and movable with said one component and which are movable, under centrifugal force, relative to said one component between an inoperative position and an operative position, spring means biassing the stop means toward their inoperative position in which position they are retracted in said one component, means for applying said fluid pressure to said stop means to urge the stop means to their inoperative position, said stop means being maintained in said inoperative position by the fluid pressure of said fluid pressure means when said fluid pressure is above a predetermined value, but when, with said rotor rotating above a predetermined rotational speed, said fluid pressure falls below said predetermined value, the stop means are displaced, solely under centrifugal force and against the bias of said spring means, to their operative position, in which position they project outwardly from said one component, and abutment means, forming part of the other of said components, which is disposed at a predetermined position intermediate said end-of-stroke-defining positions, which lies in the path of said stop means when said stop means are projecting from said one component, and which serves, upon said stop means coming into engagement therewith, to cause arrest of said one component only when that component is moving in said one direction and has not yet reached said one end-of-stroke-defining position.

4,037,987

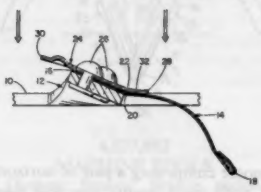
FLEXIBLE BLADED FAN WITH INCREASED NATURAL FREQUENCY

Herbert N. Charles, and George K. Lie, both of Chatham, Canada, assignors to Fram Corporation, East Providence, R.I.

Filed June 30, 1975, Ser. No. 591,511

Int. Cl.[2] F04D *29/36*

U.S. Cl. 416—132 A **5 Claims**



1. In a fan comprising a hub and a plurality of fan blade assemblies each comprising: an arm extending radially outwardly from said hub; a flexible, resilient blade having a radially extending leading portion, defined by the direction of fan rotation, connected to said arm, said blade extending transversely from said leading portion to a trailing edge behind said arm, said blade curved from said leading portion to said trailing edge in a downstream direction relative to airflow direction; and a reinforcing member extending radially along said blade leading portion on the upstream side thereof and extending transversely to a trailing edge between said leading portion and said blade trailing edge; said blade leading portion and said reinforcing member in contact along the radial extent of said reinforcing member and spaced apart at a gap behind said leading portion; the improvement in which:

said blade and said reinforcing member, with said fan stationary, contact along the radial extent of said reinforcing member at a second position behind said leading portion and said gap, said reinforcing member being curved in an upstream direction behind said blade leading portion at said gap and said blade being bent upstream between said blade leading portion and said reinforcing member trailing edge and contacting said reinforcing member at said second position between said bend and said trailing edge and therebehind said blade being curved in said downstream direction, said reinforcing member at said second position biasing and pre-stressing said blade in a downstream direction; whereby the natural frequency of said blade is raised by the prestressing contact of said blade and said reinforcing member.

4,037,988

FLEXURE HAVING PITCH FLAP COUPLING

George William Laird, Greenville, Del., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 526,994, Nov. 25, 1974, abandoned. This application May 10, 1976, Ser. No. 684,935

Int. Cl.[2] B64C *27/44*

U.S. Cl. 416—141 **4 Claims**

1. A composite structure flexure having a longitudinal centerline for connecting a rotor blade having a chord line to a rotor hub in a bearingless rotor assembly, wherein the composite structure comprises fibers held together by a bonding agent, wherein reference Cartesian coordinates for said flexure are chosen such that an X axis is parallel to the longitudinal centerline of the flexure, a Y axis is parallel to the chord line of the

blade, and a Z axis is perpendicular to the X and Y axes, wherein a plurality of said fibers are bonded in parallel coplaner relation in the XY plane to form a sheet, a plurality of said sheets comprising first, second, and third sets being bonded together in layers to form said flexure, the fibers of said first set oriented to form a positive angle with the X axis, the

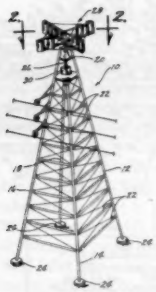
fibers of said second set oriented to form a negative angle with the X axis, the fibers of the third set being parallel to the X axis, whereby the resultant flexure allows limited three degrees of freedom of motiong of the blade to permit flap, pitch, and leadlag motion of the blade while inherently inducing a change in pitch angle of the blade in response to a change in flap angle of the blade.

4,037,989

VERTICAL AXIS WIND TURBINE ROTOR

Jerome W. Huther, R.R. No. 2, P.O. Box 36, Elkhart, Iowa 50073

Filed May 12, 1975, Ser. No. 576,338
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—197 A **3 Claims**



1. A vertical axis wind turbine comprising in combination,

a stationary frame member,

a rotatable shaft vertically journaled in said stationary frame member,

circumposed on said rotatable shaft a wind rotor comprised of a rotatable frame, the longitudinal axis of said rotatable frame being generally transverse to the longitudinal axis of said rotatable shaft, so that said rotatable frame may rotate about the longitudinal axis of said rotatable shaft,

said rotatable frame having at least two arms oppositely disposed with respect to each other radiating outwardly from said rotatable shaft, one of said arms having mounted thereon at least two concave surfaced semi-cylindrical shaped wind catching members, said wind catching members being spaced apart to define a wind break gap therebetween, and

the other of said arms having mounted thereon at least two convex surfaced semi-cylindrical shaped wind deflecting members, said wind deflecting members being spaced apart to define a wind break gap therebetween,

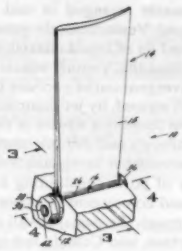
said wind break gaps, cooperatively acting with said semi-cylindrical shaped wind catching members and said semi-cylindrical shaped defelecting members during periods of strong wind to prevent destruction of said wind turbine caused by the stresses of excessively high rotational speeds induced by strong winds.

4,037,990

COMPOSITE TURBOMACHINERY ROTOR

David J. Harris, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed June 1, 1976, Ser. No. 691,390
Int. Cl.[2] F01D *5/32*
U.S. Cl. 416—220 R **10 Claims**



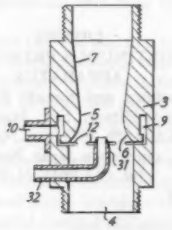
1. A turbomachinery blade comprising an airfoil section fabricated of a plurality of bonded filament laminates and a pair of hollow inserts, each insert having a generally semicylindrical outer arcuate surface, and wherein said laminates extend from the airfoil section, pass between said inserts and then are divided into two portions, each portion being wrapped essentially 180° around the outer arcuate surface of one of said inserts before being led back into the airfoil section, thereby forming a generally cylindrical, rotatable root for the blade.

4,037,991

FLUID-FLOW ASSISTING DEVICES

Peter John Taylor, Fareham, England, assignor to The Plessey Company Limited, Ilford, Essex, England

Continuation of Ser. No. 382,689, July 26, 1973, abandoned, which is a continuation of Ser. No. 223,648, Feb. 4, 1972, abandoned. This application Sept. 15, 1975, Ser. No. 613,415
Int. Cl.[2] F04B *23/14*; F04F *5/46*
U.S. Cl. 417—80 **3 Claims**



1. In a system for supplying liquid fuel to an engine via a positive-displacement fuel pump, the system including a dynamic pump having an outlet leading to said positive-displacement pump and an inlet and producing an increase of pressure at said outlet over the pressure at said inlet, and an inlet line having a low-pressure inlet and having an increased-pressure outlet connected to the inlet of said dynamic pump, said inlet line comprising in combination:

a. an inlet-line member having solid walls forming a through passage and having means for attachment of said member to said dynamic pump with one end of the through passage connected to said inlet of the latter pump, said passage having a Venturi throat interposed between a first

passage portion that extends from the throat to said one end of the passage, and a second passage portion that extends to the throat from the other end of the passage and includes a Venturi inlet and a convergent inlet portion leading from said Venturi inlet to the Venturi throat, said first passage portion including an outlet adjacent to said one end of the passage and a divergent diffusor portion leading from the throat to said outlet to form, jointly with said throat and said converging inlet portion, a Venturi-nozzle passage, said inlet portion, throat, and diffusor portion being all defined by said solid walls of said inlet-line member, and

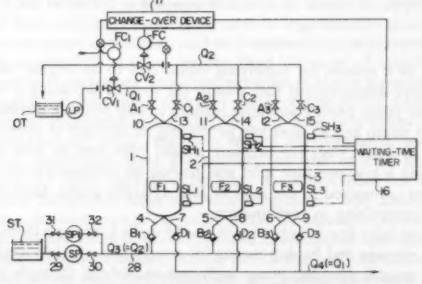
b. a jet-forming nozzle arranged in said through passage coaxially with said Venturi-nozzle passage to form and direct a high-speed jet of liquid coaxially into the convergent inlet portion of the Venturi nozzle passage towards the throat and divergent outlet portions thereof to become mixed with liquid aspired, by jet-pump action, through the Venturi inlet, thus forming a stream of the resulting mixed liquid flowing through said diffusor portion to said outlet and said inlet-line member being additionally formed with an annular array of ports constituting a Coanda-slot system encircling said convergent inlet portion and opening into the same through the passage wall defining said convergent inlet portion, said Coanda slot system defining an annular zone encircling the passage and substantially separating said wall into an upstream portion and a downstream portion, the mutually facing edges of said upstream and downstream portions being respectively formed as an upstream lip and a downstream lip, and with an injection-liquid passage leading from a point outside and said inlet-line member to said annular Coanda-slot system to discharge through said injection-liquid passage into said convergent inlet portion of the through passage, the wall defining said inlet portion including, extending from said downstream lip towards the Venturi throat, an annular zone whose surface forms a continuous extension of the surface of the downstream lip and recedes from the direction of discharge of said high-speed flow of liquid in the Coanda-slot system at a sufficiently gradual progression to ensure that the liquid thus discharged through the Coanda-slot system tends to follow, through said throat and said divergent outlet portion, due to the Coanda effect, the surface of the solid wall in said through passage and form there a layer of longitudinally moving liquid which, due to the Coanda effect, adheres to the said solid wall and thus separates the stationary surface of said wall from the said stream of mixed liquid.

4,037,992

SLURRY CONTINUOUS PRESSURE-FEEDING APPARATUS

Kenji Uchida, Kashiwa, and Kenichi Fujita, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 29, 1975, Ser. No. 609,051
Claims priority, application Japan, Nov. 25, 1974, 49-134279
Int. Cl.[2] F04F 11/00
U.S. Cl. 417—102 **9 Claims**



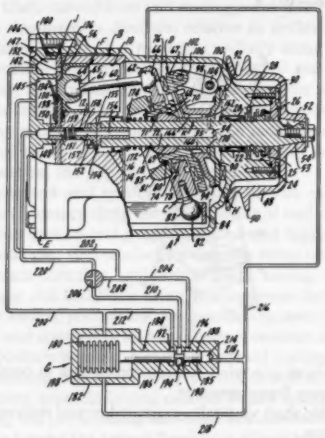
1. In a slurry continuous pressure-feeding apparatus comprising three feed chambers arranged in parallel with one another and each having a float disposed in the interior thereof, a high-pressure pump adapted to deliver driving liquid to each of said feed chambers, a main slurry pump adapted to feed a slurry to each of said feed chambers, check-valves mounted in slurry inflow pipes and slurry outflow pipes and change-over valves mounted in driving liquid inflow pipes and driving liquid outflow pipes, detectors adapted to detect the upper and lower limits of said floats and open and close said change-over valves, a waiting timer adapted to detect a minimum opening and closing time for the two change-over valves provided to each of said feed chambers, and a change-over device for adjusting the inflow amount and the outflow amount of the driving liquid, the improvement comprising an auxiliary slurry pump connected removably in parallel with said main slurry pump through the agency of opening-and-closing valves said main slurry pump and said auxiliary slurry pump being rendered operative conjointly when two of the three feed chambers are used to continuously pressure-feed the slurry whereby the same amount of slurry that can be fed when all the three feed chambers are used can be fed by using two feed chambers.

4,037,993

CONTROL SYSTEM FOR VARIABLE DISPLACEMENT COMPRESSOR

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 23, 1976, Ser. No. 679,547
Int. Cl.[2] F04B 1/26
U.S. Cl. 417—222 **5 Claims**



1. A variable displacement compressor comprising a plurality of cylinders and pistons cooperating to provide gas working spaces, each said cylinder having a suction and discharge port cooperating therewith; a wobble plate connected to said pistons and imparting the reciprocating force to actuate said pistons; a drive shaft; a cam mechanism driven by said drive shaft and cooperating with said wobble plate, said wobble plate and cam mechanism being pivoted at a point spaced from the drive shaft axis and movable from a position wherein said wobble plate is positioned along a plane substantially normal to said drive shaft axis to a position angularly displaced from said normal plane; a mounting element supporting said cam mechanism, and mounting element having an outer spherical surface engaging said cam mechanism and a central bore through which said drive shaft extends, said mounting element being slidable to and fro on said drive shaft as the wobble plate angle is changed; and a fluid actuator comprising a piston and cylinder arrangement in which increased pressure in said actuator cylinder causes the actuator piston to move said wobble plate

in a direction toward said normal plane, reducing the stroke length of said pistons; and means for supplying high pressure gas from said gas working spaces to said actuator cylinder, said last-named means including a control valve responsive to a variable indicative of capacity requirements.

4,037,994

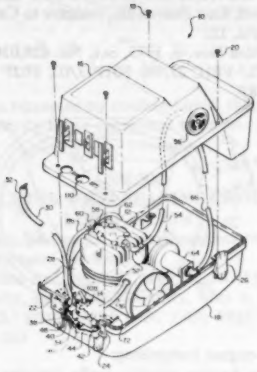
PRESSURE UNLOADING VALVE DEVICE FOR COMPRESSOR

Forrest M. Bird, 212 NW. Cerritors, Palm Springs, Calif. 92262

Filed Mar. 31, 1975, Ser. No. 563,692

Int. Cl.[2] F04B *49/02*

U.S. Cl. 417—316 **4 Claims**



1. A device for use with a gas compressor having an outlet passage for directing gas to end use apparatus, including the combination of a valve body having at least one relief port and an inlet port in connection with the outlet passage of said compressor, means forming a chamber in the valve body for establishing fluid communication with said inlet and relief ports, a compressible elastomeric member mounted within said chamber, said member being sized to define in its substantially uncompressed state a clearance with the wall of the chamber, said clearance establishing a gas relief flow path through the chamber between said inlet and relief ports, said member in its compressed state contacting said chamber wall to occlude said relief flow path, and actuator means operable in one mode for causing said member to assume its compressed state and occlude the flow path while energizing said compressor, said actuator means further being operable in another mode for causing said member to assume its uncompressed state while said compressor is deenergized whereby gas pressure is relieved from the compressor outlet through said relief flow path and through the relief port of the valve body, said actuator means including a plunger slidably mounted for movement within the chamber, cam means operable for movement between a compressor-on and a compressor-off position, said cam means in the compressor-on position moving the plunger in a first direction for exerting a thrust force against the elastomeric member to cause the same to assume its compressed state, the cam means in said compressor-off position permitting movement of the plunger in a second direction away from the elastomeric member to cause the same to assume its uncompressed state, electrical contact means operable between first and second positions in which said gas compressor is operatively disconnected and connected, respectively, with a source of electrical power, and a second plunger disposed in operating engagement with said contact means, said second plunger being positioned in juxtaposed relationship with said elastomeric member whereby the latter undergoes respective elastic bulging and contraction between said compressed and uncompressed states for moving the second plunger to operate said contact means between respective second and first positions.

4,037,995

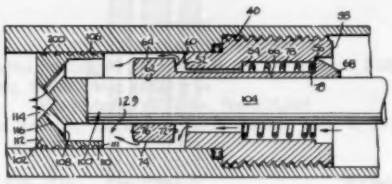
LIQUID PROPELLANT GUN (DAMPER)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,868

Int. Cl.[2] F04B *17/00*

U.S. Cl. 417—349 **5 Claims**



2. A pump comprising:

a cylinder having a bore on a longitudinal axis with an inlet end and an outlet end;

a piston having a head journaled for reciprocation in said cylinder bore along said longitudinal axis,

said head having

a first face which is proximate to said bore outlet end and has a first effective transverse area,

a second face which is proximate to said bore inlet end and has a second effective transverse area which is less than said first area,

a cylindrical surface about said longitudinal axis and extending to and between said first and second faces and riding against the interior wall of said cylinder bore,

at least one bore of a first diameter passing through said head to and between said first and second faces,

at least one groove in said head cylindrical surface extending to and between said first and second transverse faces at an angle to said longitudinal axis, of a second diameter,

first means disposed in said bore inlet end for initially inletting a quantity of liquid into said bore through said inlet end and for subsequently closing said inlet end, having a first face proximate to said piston head second face,

second means for traversing said head towards said first means,

said piston head second face and said first means first face, at a first longitudinal spacing between said piston head and said first means, mutually defining a first closed cavity having a first outlet through said piston head bore and a second outlet through said piston head groove, and at a second longitudinal spacing between said piston head and said first means, which second spacing is less than said first spacing, mutually defining a second closed cavity having an outlet through said piston head bore and a third closed cavity having an outlet through said piston head groove.

4,037,996

VOLUMETRIC PUMP

Willi Löliger, Konolfingen, Switzerland, assignor to Alpura Koreco A.G., Konolfingen, Switzerland

Filed Nov. 17, 1975, Ser. No. 632,770

Claims priority, application Switzerland, Nov. 22, 1974, 15538/74

Int. Cl.[2] F04B *7/00*

U.S. Cl. 417—518 **5 Claims**

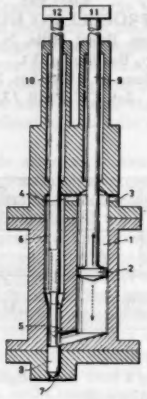
1. Volumetric pump comprising

a cylinder chamber,

a piston reciprocably driven in said cylinder chamber,

an inlet at one end of said cylinder chamber,

ports at each end of said cylinder chamber,
a passage connected to and between said ports,
a valve movably mounted in said passage for controlling the



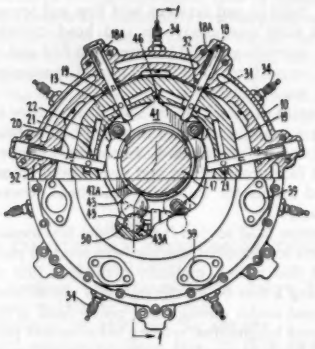
flow in said passage, means outside said cylinder chamber for driving said valve in said passage, and
a closable outlet connected with the cylinder port at the cylinder end opposite the inlet end.

4,037,997

ORBITAL ENGINE WITH STABILIZING PLATE

Tony Ralph Sarich, 9 Halse Place, Karrinyup, Australia

Filed Feb. 3, 1976, Ser. No. 654,934
Claims priority, application Australia, Feb. 3, 1975, 0454/75
Int. Cl.² F01C *1/02*
U.S. Cl. 418—61 R **9 Claims**



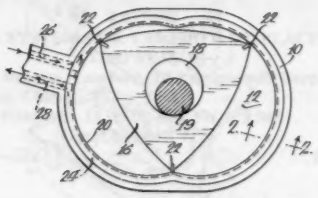
1. A motor comprising:
a housing member having a cavity defined by an internal peripheral wall and opposed end walls,
a shaft supported for rotation relative to said housing member and having an axis of rotation,
a piston member mounted on said shaft eccentrically with respect to said axis of rotation to orbit within said cavity upon rotation of said shaft, said piston having a piston axis,
a plurality of vanes spaced circumferentially from one another to divide said housing into a plurality of chambers,
vane support means carried by at least one said piston member or said housing member and supporting said vanes in engagement with said housing walls and with said piston member as said piston orbits, whereby said vanes, said walls, and said piston member define a plurality of said chambers that vary in volume in sequence as said piston member orbits,
a control member journalled on said shaft coaxial with said piston axis,
piston member connecting means carried by said piston member and said control member for preventing angular movement of said control member with respect to said piston member, and
control member connecting means operatively connecting said control member to said housing member so that said control member moves in an orbital path corresponding to the orbital path of said piston member.

4,037,998

ROTARY ENGINE COOLING

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1975, Ser. No. 628,020
Int. Cl.² F01C *21/06;* F01P *3/02;* F02F *1/14*
U.S. Cl. 418—83 **9 Claims**



1. A rotary engine comprising:
a. a housing having interior walls defining an operating chamber;
b. a rotor mounted for movement in said chamber;
c. a thin layer of wear resistant metal within said chamber and located to be sealingly engaged by said rotor as said rotor moves within said chamber; and
d. a backing for said thin layer interposed in sandwiched relation between said thin layer and said housing for transmitting pressure applied to said thin layer to said housing, said backing being formed of a metal having high thermal conductivity and being provided with a plurality of relatively closely spaced, elongated, coolant passages, said backing including a plurality of protrusions extending into said passages to introduce turbulence in a coolant passing through said passages, said passages having a substantially uniform cross sectional area along their length.

4,037,999

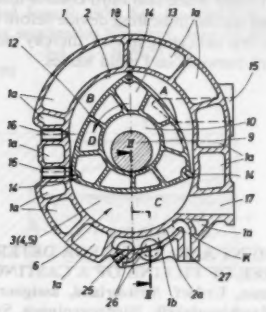
LIQUID-COOLED ROTARY PISTON INTERNAL COMBUSTION ENGINE WITH HOUSING

Bauder Armin; Lechler Rolf, both of Neckarsulm; Steinwart Johannes, Obersulm-Willsbach, and Wilmers Gottlieb, Neuenstadt, all of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsium,Wurrt, Germany

Filed Mar. 12, 1976, Ser. No. 666,404
Claims priority, application Germany, Mar. 15, 1975, 2511451
Int. Cl.² F01C *21/06*
U.S. Cl. 418—84 **5 Claims**

1. Liquid-cooled rotary piston internal combustion engine with a housing consisting of at least one annular shell with interior guideway and two parallel end walls and bounding an interior space, the shell containing first and second cavities for circulation of two separate cooling circuits with said first cavity being arranged in the region of the housing where the

expansion and exhaust strokes take place in the interior space, and a liquid-cooled piston revolving in the interior space and



having cavities traversed by cooling liquid, the piston cavities and said first cavity being connected in series.

4,038,000

GEAR MACHINE WITH BEARING COOLING AND LUBRICATION

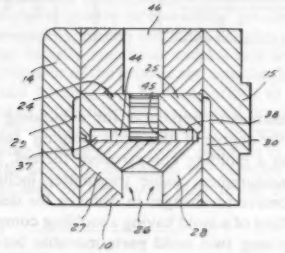
Wilhelm Dworak, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 10, 1975, Ser. No. 567,113

Claims priority, application Germany, May 4, 1974, 2421599

Int. Cl.[2] F01C *21/04*; F03C *3/00*; F01C *1/18*

U.S. Cl. 418—102 **6 Claims**



1. In a gear machine, such as a gear pump or motor, a combination comprising a housing having an inner circumferential wall bounding a chamber; inlet and outlet ports in communication with said chamber for respectively admitting and discharging fluid relative thereto; gearing means mounted in said chamber and including a pair of meshing gears each having respective shafts at opposite axial sides of said gearing means; bearing sleeves journalling said shafts for rotation; wall means bounding said chamber at opposite ends thereof, said wall means being a pair of side walls each formed with a recess which overlies the respective shafts at each axial side of said gearing means; a pair of bores formed in said housing and extending from one of said ports to a respective one of said recesses at each axial side of said gearing means, said bores constituting the only source of communication with said one port and having a combined cross-sectional configuration such that all of the fluid at said one port communicates with said recesses; means for simultaneously cooling and lubricating all of the interior sleeve regions which surround said shafts, including interior passage portions formed in the internal surfaces of said sleeves, said interior passage portions communicating with said recesses and being operative for conveying all of the fluid from said one port along a part of the lengths of the respective shafts so as to cool and lubricate the latter; means for simultaneously cooling and lubricating all of the exterior sleeve regions which face said circumferential wall, including exterior passage portions formed in the external surfaces of said sleeves, said exterior passage portions communicating with said interior passage portions and being operative for conveying all of the fluid from the latter along a part of the lengths of the respective sleeves so as to cool and lubricate the latter; and passage means communicating said exterior passage portions with said chamber, whereby all of the fluid passing through the machine is employed in cooling and lubricating all of the sleeves and all of the shafts in a simultaneous and uniform manner.

4,038,001

CENTRIFUGAL MOULDING

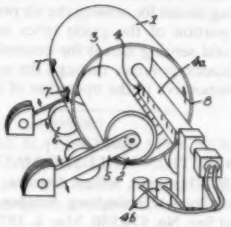
Wolf Walter Stinnes, 31 Johan Rissik Ave., Waterkloff Ridge, Pretoria, South Africa (0002)

Filed May 6, 1975, Ser. No. 575,085

Claims priority, application South Africa, May 8, 1974, 74/2928

Int. Cl.[2] B29C *27/16*

U.S. Cl. 425—110 **5 Claims**



1. Apparatus suitable for moulding reinforcing fibres and a settable liquid bonding agent comprising:

a rotatable hollow mould form having at least one axial opening:

means for rotating the mould form about its longitudinal axis in actuating relationship with the mould form;

a rotatable mandrel located within the mould form parallel to the longitudinal axis thereof for rotatably mounting a multilayered roll of reinforcing fibres in the mould form;

rolling means adjacent the mould form for rotatably holding the mandrel within the mould form, the holding means being adapted to move the roll from a position wherein it is spaced from the mould form inner surface to a position wherein it is in contact therewith;

rotating means, on the holding means, for rotating the mandrel about its axis; and

means for injecting a settable liquid bonding agent into the mould form located within the annular space of the mould form.

4,038,002

PELLETIZER

Yoshio Inaba, and Takashi Hisagi, both of Tsuruga, Japan, assignors to Toyobo Co., Ltd., Japan

Filed Dec. 24, 1974, Ser. No. 536,183

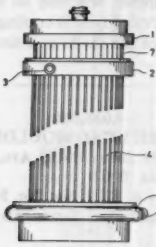
Claims priority, application Japan, Dec. 24, 1973, 48-3575

Int. Cl.[2] B29F *3/06*

U.S. Cl. 425—136 **7 Claims**

1. A substantially vertically disposed pelletizer apparatus utilizing a hydraulic suction force for the pelletization of a thermoplastic polymer which comprises a plurality of nozzle means for extruding a thermoplastic polylmer in a melt state into strands, a plurality of injector means disposed below corresponding nozzle means, said injector means receiving the strands from the nozzle means, and provided with means for introducing water and air together with said strands, a plurality of guide tubes disposed below corresponding injector

means, said guide tubes defining a space therein for receiving said strands and water-air mixture, said water cooling and solidifying the strands during their travel through said guide tubes, a cutter means disposed below the guide tubes for cutting the cooled and solidified strands, and an automatic control system for controlling the amount of thermoplastic polymer



extruded through the nozzle means, said automatic control system including means for sensing the air pressure of the space in the upper portion of the guide tubes and control means connected to said sensing means for controlling the extrusion of the thermoplastic polymer through the nozzle, said control means being responsive to the operation of the sensing means.

4,038,003

INJECTION MOLDING MACHINE

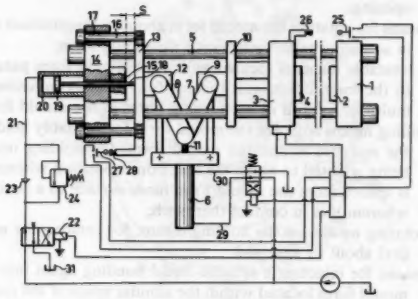
Jan Erik Enefrid Hansson, Viken, Sweden, assignor to Sund-Akesson Aktiebolag, Helsingborg, Sweden

Continuation of Ser. No. 574,850, May 6, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,784

Claims priority, application Sweden, May 14, 1974, 7406408

Int. Cl.[2] B29C *1/00*

U.S. Cl. 425—137 **1 Claim**



1. An injection molding machine comprising: first and second mold halves mounted for relative movement along a longitudinal axis, a stop and a link plate each mounted along said longitudinal axis so that said link plate is movable towards said stop against a pressure device, drive means for driving said mold halves towards each other along said longitudinal axis and for driving said link plate towards said stop along said longitudinal axis, first control means for maintaining a high pressure in said pressure device for preventing contact between said link plate and said stop during the starting phase of the mold closing, second control means actuated in response to said mold halves moving together and arriving at a fixed distance relative to each other or the relative movement of said mold halves during closing decreasing in speed to a predetermined value for switching said pressure device from a high pressure to a low pressure so that said drive means drives said link plate and said stop into contact with each other, a first device operable to indicate to a third control means the contact of said mold halves during proper operation, a second device operable to indicate to said third control means the contact of said link plate and said stop, said third control means being operative to retract said drive means to move said mold halves away from each other when said third control means receives a signal from said second indicating device before it receives a signal from said first indicating device, thereby indicating that an object is stuck between said mold halves.

4,038,004

MEASUREMENT APPARATUS FOR DETERMINING THE DEGREE OF FILLING OF A CASTING MOLD

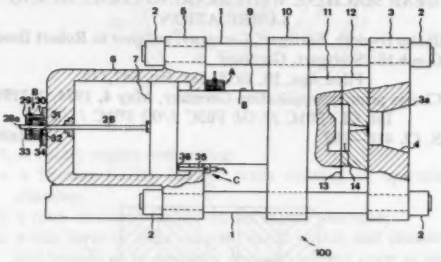
Eduard Hartmann, Urdorf, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland

Filed July 28, 1975, Ser. No. 599,880

Claims priority, application Switzerland, Aug. 7, 1974, 10806/74

Int. Cl.[2] B29F *1/06*

U.S. Cl. 425—150 **11 Claims**



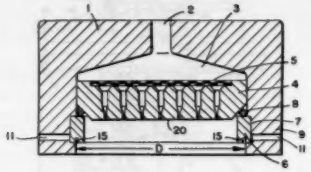
1. A measurement apparatus for a molding machine for controlling the degree of filling of a molding mass filled under pressure into a molding compartment thereof, comprisingan electrical measurement value transmitter including sensing means responsive to changes in distance for determining the degree of filling of a mold having a molding compartment, said mold comprising two mold parts movable between a mold closure positin and a mold open position, at least one fluid-operated displacement means moving the mold parts against one another into the mold closure position, said fluid-operated displacement means comprising a closure cylinder and a closure piston cooperating with said mold, said measurement value transmitter comprising a first transmitter component and a second transmitter component, the first transmitter component being secured to the closure cylinder and the second transmitter component being coupled to allow relative movement with the closure piston, means providing a drag connection between the second transmitter component and the closure piston throughout a given range of movement of said closure piston, and during movement of said closure piston within said given range of movement said drag connection having means effective to allow relative movement between said first transmitter component and said second transmitter component and no relative movement between said second transmitter component and said closure piston, and when said closure piston has moved outside of said given range of movement said transmitter components being arranged so that said drag connection is rendered ineffective, said closure piston and said second transmitter component being coupled to allow relative movement and said first transmitter component and said second transmitter component having no relative movement therebetween.

4,038,005

NOZZLE PLATE HOLDER

Erich Lenk, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik, Wuppertal, Germany

Filed June 9, 1975, Ser. No. 584,925
Claims priority, application Germany, June 20, 1974, 2429654
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—190 9 Claims



1. In combination with an apparatus for the extrusion of a molten thermoplastic polymer including a nozzle plate arranged perpendicularly to the axial direction of flow of the polymer melt therethrough, an improved holding means for said nozzle plate comprising:

a housing having side walls enclosing an axially extending cavity, said housing having a feed opening into said cavity at its inlet end to receive said polymer melt for extrusion and a discharge opening at its opposite end, the discharge opening of said housing being open to axially insert said nozzle plate along the inner wall surface formed by the sides of the housing;

a peripheral groove extending around the inner wall surface of said housing at an axially spaced interval from the discharge end thereof;

a plurality of supporting ledge elements removably inserted into said peripheral groove in end-to-end proximity and extending completely around the inner periphery of said side walls, the radially innermost ends of said ledge elements projecting out of the groove and into the discharge opening of said housing as a bearing surface to support said nozzle plate when fully inserted in said housing; and

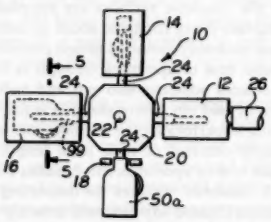
a sealing ring removably inserted between the nozzle plate and said bearing surface of the ledge elements to support and to seal the nozzle plate against the pressure exerted axially by the melt on the nozzle plate in the discharge direction.

4,038,006

APPARATUS FOR MAKING A BLOW MOLDED CONTAINER WITH HOLLOW HANDLE AND METHOD OF MAKING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 479,547, June 4, 1974, Pat. No. 3,928,522.
This application Dec. 17, 1975, Ser. No. 641,482
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—525 9 Claims



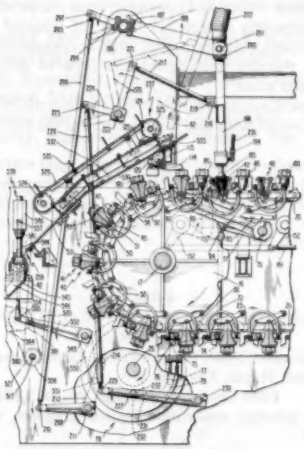
1. Apparatus for making an injection blow molded plastic container having a hollow handle projecting from a side of the container and of one-piece construction therewith, including in combination, an injection mold in which a parison is applied to a core rod, said injection mold being formed with a cavity so that the parison is thicker at that portion at which the handle is to be formed, a first blow station to which the core rod and parison are transferred, a first blow mold at the first blow station, having a cavity therein with a handle forming portion of the cavity for receiving the said thicker parison portion, means for applying fluid pressure to the inside of the parison to expand the said thicker parison portion into the handle portion of the cavity and to partially expand the remainder of the parison to a partially formed container, a part of the walls of the handle portion of the cavity of the first blow mold comprising mens to shear from the handle portion of the parison a part of the plastic thereof so as to form a hollow handle, a second blow mold, and means for transferring the partially blow container to the second blow mold, said second blow mold having a cavity with a handle portion shaped to the final contour for the container, and into which the hollow handle formed in the first blow mold is received, and means for supplying blowing fluid to expand the partially blown container in the second blow mold.

4,038,007

APPARATUS FOR MAKING HOLLOW MOLDED PRODUCTS

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Division of Ser. No. 103,707, Jan. 4, 1971, Pat. No. 3,958,912.
This application May 1, 1973, Ser. No. 356,189
Int. Cl.[2] B29C *5/00*
U.S. Cl. 425—259 13 Claims



1. Apparatus for producing hollow products comprising a conveyor carrying a row of a plurality of longitudinally spaced molds alternately through an oven to bake a moldable material within the molds and through a zone outwardly thereof, means at said zone for lifting the baked products upwardly out of successive molds, said product lifting means comprising suction means for supporting the product, pump means for charging successive molds with said material, and means for moving said pump means longitudinally from a terminal position substantially in synchronism with each mold while the latter is being thus charged by the pump means.

4,038,008

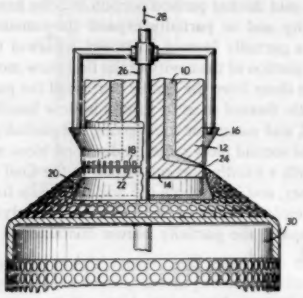
PRODUCTION OF NET OR NET-LIKE PRODUCTS

Ronald Leslie Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 440,963, Feb. 11, 1974, abandoned. This application July 14, 1975, Ser. No. 595,721

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—290 **3 Claims**



1. Apparatus for the production of thermoplastic structures comprising:

a. an annular extrusion die of a stated diameter and including a pair of spaced die members, said die members defining a single, continuous annular extrusion orifice on the periphery of the extrusion die through which a unitary tube of molten polymer can be extruded substantially radially outward from the extrusion die;

b. a pair of annular perforating members having a plurality of spaced teeth rigidly affixed to each other with one disposed below the extrusion orifice and the other disposed above the extrusion orifice with the teeth in each perforating member being axially positioned adjacent the extrusion orifice and operative upon reciprocating motion to alternately completely block off selected areas of the said continuous extrusion orifice corresponding to said teeth thereby interrupting the flow of polymer at said selected areas;

c. said perforating members being substantially in axial sliding contact with said die members at the extrusion orifice; and

d. an annular mandrel disposed below said extrusion die said mandrel having a diameter greater than the said stated diameter whereby the extruded molten polymer tube will be at least partially oriented when it is drawn over said mandrel.

4,038,009

APPARATUS FOR THE MANUFACTURE OF DISC RECORDS

William Herbert Toull, West Drayton, England, assignor to E M I Limited, Hayes, England

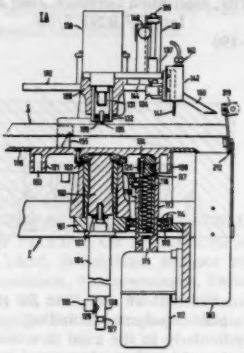
Filed Sept. 16, 1975, Ser. No. 613,873

Claims priority, application United Kingdom, Oct. 3, 1974, 42897/74

Int. Cl.[2] B29D *17/00*

U.S. Cl. 425—308 **10 Claims**

1. Apparatus for the manufacture of a disc record including a source of material mouldable for processing to a disc record operable to supply said material to a first work station at which to form a shot of said material, a second work station at which to press from said shot a disc with surplus material attached as flash, a third work station at which to trim said flash material from said disc, a receiver for trimmed disc records and a reciprocal transfer assembly having first second and third transfer elements simultaneously operable forwardly to pick-up material in process from a respective work station and transfer it to a set-down position and return empty to the pick-up work station, the transfer assembly also having a flash clearing element simultaneously operable with said transfer elements to



sweep trimmed flash from the third work station to a discharge point.

4,038,010

APPARATUS FOR PRODUCTION OF GRANULATED AND PULVERIZED PARTICLES FROM PASTY OR SIMILAR MATERIAL

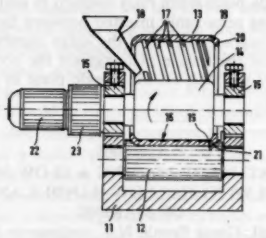
Horst Bremer, Lage, Germany, assignor to Gunther Papenmeier KG Maschinen-und Apparatebau, Detmold, Germany

Filed Oct. 7, 1974, Ser. No. 512,871

Claims priority, application Germany, Oct. 10, 1973, 2350746

Int. Cl.[2] B29B *1/03*

U.S. Cl. 425—314 **24 Claims**



1. Apparatus for producing granulates from pulverulent, granular, doughy or similar material, such as plastics, comprising: rotatably mounted means having two closely adjacent but spaced apart rotatable curved surfaces, providing an elongate zone nip where the rotatable surfaces are approaching each other and each surface being rotatable about an axis; means on at least one of said rotatably mounted means providing at least one circumferential row of apertures through at least one of said rotatable surfaces adjacent said nip and spaced axially from said portion of said nip where material is fed, said rotatable surfaces being imperforate over a continuous extent of at least approximately one-half of their axial length extending from adjacent said row of apertures; drive means connected to said means with rotatable surfaces for imparting rotational drive thereto; means located adjacent said zone nip for continuously feeding material into one portion of the zone nip between the rotatable surfaces where said surfaces are imperforate; said surfaces at said zone providing periodic and repeated kneading action on the material causing it to be formed as a

skin and conveyed in the axial direction and along the length of the adjacent imperforate portions of the rotating surfaces toward said at least one row of apertures; said surfaces, when rotating, providing a force on and causing kneaded material, when it has progressed to said row to pass through said apertures; and means located at the exit side of said apertures enabling granulating of the material extruding from said apertures.

4,038,011

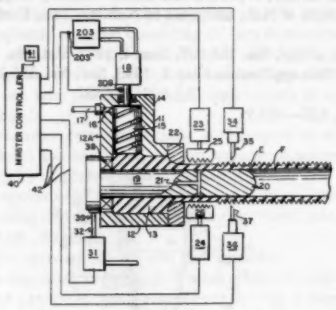
APPARATUS FOR FORMING RIBBED TUBING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 319,194, Dec. 29, 1972, and a continuation-in-part of Ser. No. 68,724, Sept. 1, 1970, Pat. No. 3,708,253. This application Jan. 28, 1975, Ser. No. 544,833

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—325 **3 Claims**



1. An apparatus for forming a tubular extrusion having a smooth inside wall surface and an irregular external wall surface comprising:

first means for extruding a plastic material in the shape of a tube, said first means including an extrusion die and a stationary mandrel extending through said die for forming the inside surface of a tubular extrusion formed in said die,

said mandrel having an end portion protruding a distance outwardly from said die,

second means including tooling located externally of said die, said tooling including a pair of forming dies each having at least one semi-circular rib-like formation, said forming dies being operable to engage the tubular extrusion formed in said die against the end portion of said mandrel immediately after said extrusion has exited from said die,

third means connected to said tooling for powering operating said tooling in synchronization with the movement of the extrusion from said die to cause said tooling to intermittently engage and disengage said tubing against said mandrel and to (predeterminately) deform a portion of the outer stratum of the extrusion as the extrusion passes over said mandrel so as to mold a plurality of circumferentially extending circular rib-like formations around said wall of said extrusion for varying the physical characteristics of said tubular extrusions.

4,038,012

MULTIPLE-ROLL CALENDARS FOR PRODUCING THERMOPLASTICS FILM

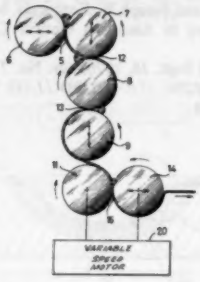
Gottfried Sander, Richterich, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed July 21, 1975, Ser. No. 597,531

Claims priority, application Germany, Aug. 14, 1974, 2438983

Int. Cl.[2] B29C *15/00*

U.S. Cl. 425—363 **4 Claims**



1. A calender for producing thermoplastics films and comprising a plurality of calender rolls wherein viewed in the direction of working, a penultimate roll of said rolls is spaced from a roll of said rolls which immediately precedes said penultimate roll so that in operation of the calender a portion of the material being calendered, for a period as it travels from said preceding roll to said penultimate roll, is not in contact with any of said rolls, and said penultimate roll and a final one of said rolls which together define a final working gap, are provided with drive means whereby they can be driven at varying speeds independently of the others of said rolls.

4,038,013

SPINNERET APPARATUS WITH PARTICULATE MATERIAL CONVEYING MEANS

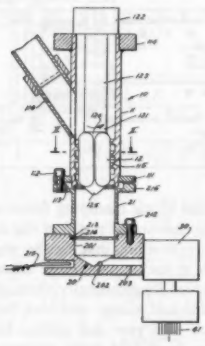
Ian Tomlinson, Rossendale, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Mar. 31, 1976, Ser. No. 672,432

Claims priority, application United Kingdom, Apr. 29, 1975, 17818/75

Int. Cl.[2] D01D *5/02*

U.S. Cl. 425—378 S **11 Claims**



1. An apparatus for conveying particulate material, comprising a cylindrical barrel having an internal wall provided with a screw thread; means for feeding said material into said barrel; a member mounted in said barrel and extending along at least part of the axial length of said screw thread, said member being of a polygonal cross-section having a transverse dimension

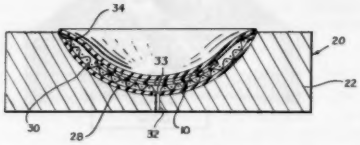
closely approximate to the inner diameter of the screw flights of said screw thread so as to allow movement of said material in a direction of said axis but to substantially prevent rotation of said material about said axis relative to said member; and means for causing relative rotation of said member and said barrel whereby to cause relative rotation of said material and said barrel to advance the material along said barrel.

4,038,014

LENS MOLD

Robert J. Dusza, and Joseph W. Kantorski, both of Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sept. 24, 1976, Ser. No. 726,708
Int. Cl.[2] B29C *17/04*; B29D *11/00*; B29C *1/02*
U.S. Cl. 425—388 **10 Claims**



1. A lens shaping mold of rigid base material having a lens blank receiving cavity of concave surface curvature substantially corresponding to a shape desired to be imparted to at least one surface of a lens placed in said cavity and urged against said cavity surface wherein the improvement comprises;

a cushion of uniform thickness extended over at least the major portion of said concave surface of said cavity, said cushion being adhered to said cavity surface; and

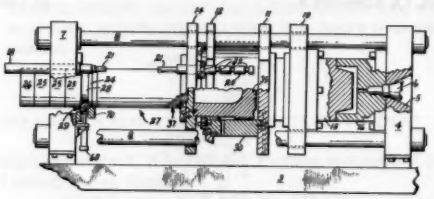
a covering of synthetic open texture fabric extended over and adhered to said cushion.

4,038,015

HYDRAULIC INJECTION MOLDING MACHINE WITH COMPRESSION RAM

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Jan. 9, 1976, Ser. No. 647,741
Int. Cl.[2] B29F *1/00*
U.S. Cl. 425—451.7 **15 Claims**



1. In a lock and block clamping force applying means for holding in a fully advanced position the movable platen of a hydraulic injection molding machine by engaging with a laterally moving lock to lock recess in the tail section of the blocking ram that moves longitudinally through the stroke of the machine and holds said platen, said lock fitting said lock recess to thereby block said ram and platen from any substantial movement away from said fully advanced position, an improved blocking ram construction that comprises:

a. said tail section having a cylindrical rear segment;

b. a plurality of annular spacer rings mounted on said rear segment;

c. a front section of said ram having a preselected diameter and which is secured to said moving platen and extends longitudinally a portion of the distance to said ram tail section;

d. said rear segment having a cylindrical sleeve portion of a diameter less than said ram front section diameter;

e. each ring of said plurality of annular spacer rings having an outer diameter substantially that of said ram front section, a predetermined longitudinal length, front and rear faces that are substantially parallel, and an inner diameter approximately but slightly larger than that of said sleeve portion, at least one of said rings being movable longitudinally on said cylindrical sleeve portion, the longitudinal dimensions of the respective rings providing means for mold height adjustment;

f. said lock recess being provided by the longitudinal dimension between the opposing faces on any two selected rings and longitudinally of a size to receive said lock and located to the rear of the rear face of one of said rings;

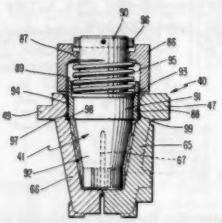
g. whereby said machine can be adjusted so its blocking ram moves to a preselected one of a number of predetermined advance positions which is coincident with the location of said recess whence said platen can be moved to said fully advanced position and, if molds be present, to hold the same closed while said lock and block construction resists opening of the mold during a molding procedure.

4,038,016

APPARATUS FOR MAKING HOLLOW MOLDED PRODUCTS

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Division of Ser. No. 103,707, Jan. 4, 1971, Pat. No. 3,958,912.
This application May 1, 1973, Ser. No. 356,204
Int. Cl.[2] A21C *11/00*
U.S. Cl. 425—451.9 **1 Claim**

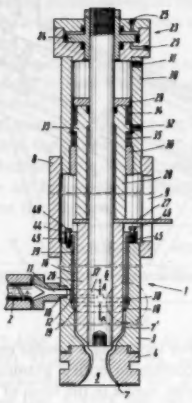


1. In apparatus for making a hollow molded product, a mold having an open end cavity, a core bar, a core supported on the core bar and adapted to be inserted in the mold cavity through said open end, the core bar overlying the mold when the core is disposed within the mold, the core bar and the core being removable from the mold, the core comprising a main central member having a flange intermediate the ends thereof and a sleeve surrounding and secured to said flange and being mounted on the core bar for limited reciprocation in a direction into and out of the mold, interengaging external and internal shoulders on the core and mold, respectively, within the mold cavity to determine the fully inserted position of the core and thereby form a closed molding space inwardly of said shoulders around the core, interengaging surfaces on said core and mold within the cavity and outwardly of said interengaging shoulders for piloting and centering the core in the cavity, a groove in the wall of said cavity between said internal shoulder and said piloting surface in the mold cavity forming a space between the core and mold within the latter to receive excess moldable material from said molding space upon insertion of the core, resilient means acting between the core bar and the core for thrusting the core into the mold, said resilient means being a coil spring surrounding the core outwardly of said flange and extending into the outer end of said sleeve, and releasable latching means acting between the core bar and the mold to lock them together.

4,038,017
EXTRUSION HEAD

Erhard Langecker, Meinerzhagen, Germany, assignor to Battenfeld Maschinenfabriken GmbH, Meinerzhagen, Germany

Filed Mar. 4, 1976, Ser. No. 663,729
Claims priority, application Germany, Mar. 6, 1975, 2510127
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—466 12 Claims



1. An extrusion head for the manufacture of a hollow string of thermoplastic material consisting of two concentric layers, the weld seams of which are circumferentially staggered in relation to one another, said extrusion head comprising:

at least one inlet passage arranged transversely in said extrusion head;

a ram chamber extending axially with respect to said extrusion head and having an annular volume to accommodate an axially displaceable annular piston;

means operatively associated with said ram chamber for deflecting and distributing said thermoplastic material into said ram chamber;

a die core downstream of said ram chamber;

a sleeve disposed concentrically with respect to said die core in said extrusion head, said sleeve having a tapered end which is disposed toward an exit slot in said extrusion head;

means operatively associated with said annular piston for axially displacing said annular piston;

means operatively associated with said die core; for axially displacing said die core;

said means for deflecting and distributing said thermoplastic material comprising:

a first annular groove surrounding said sleeve, an internal wall of said groove being formed by said sleeve; p1 a second annular groove corresponding to said first annular groove and located along with said first annular groove in a horizontal central plane;

a longitudinally displaceable separator sleeve which passes through said first and second annular grooves, said separator sleeve having an opening;

two inlet passages located above said first and second annular grooves, said inlet passages being staggered peripherally in relation to one another with one of said inlet passages opening into said first annular groove and the other of said inlet passages opening into said second annular groove via said opening in said separator sleeve;

two guide slots of selected widths which merge into said restrictor slot, said guide slots being formed by one end of said separator sleeve passing through said first and second annular grooves; and

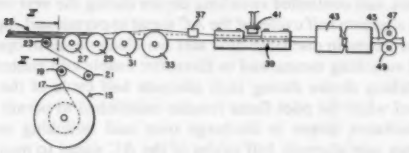
a restrictive slot formed by said tapered end of said sleeve, said restrictive slot providing a passageway through which said thermoplastic material can enter said ram chamber,

said restrictive slot having a width which corresponds to the sum of the widths of said guide slots.

4,038,018
APPARATUS FOR MOLDING OF FILAMENT-REINFORCED PLASTIC RODS

Carl R. Pepmeier, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 21, 1976, Ser. No. 697,883
Int. Cl.[2] B29C *27/14*
U.S. Cl. 425—505 8 Claims

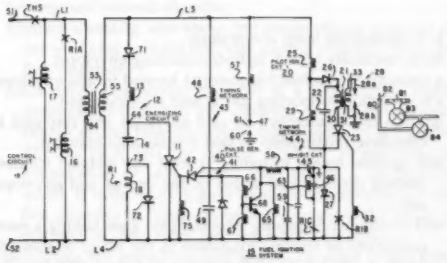


1. In an apparatus for molding of reinforced plastic rods, said apparatus including means for continuously advancing a continuous, generally flat web which is in contact with a mass comprised of a bundle of filaments embedded within an unset plastic material, means for progressively deflecting successive longitudinal edge portions of the continuous web transversely and about the mass concomitantly with the continuous advancement of the web and mass to thereby a tube encasing such mass and means for setting the plastic material of the encased mass, the improvement comprising a shaping device having an elongated passage through which the encased mass is adapted to travel during the advancement thereof towards said setting means, said elongated passage being defined by generally like annular surfaces which are dimensioned to radially squeeze the encased mass to thereby express contained air therefrom while concomitantly imparting a precise circular cross-sectional shape thereto, at least portions of said annular surfaces being spaced longitudinally from adjacent of said annular surfaces to thereby minimize frictional retardation of the encased mass during its travel through said shaping device.

4,038,019
FAIL-SAFE ENERGIZING CIRCUIT FOR A FUNCTIONAL DEVICE

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Sept. 10, 1975, Ser. No. 611,961
Int. Cl.[2] F23Q *9/14*
U.S. Cl. 431—51 20 Claims



9. In a fuel ignition system including pilot source means operable when enabled to provide a pilot flame, and main valve means operable when energized to supply fuel to a burner apparatus for ignition by said pilot flame, a control arrangement comprising switching means operable when en-

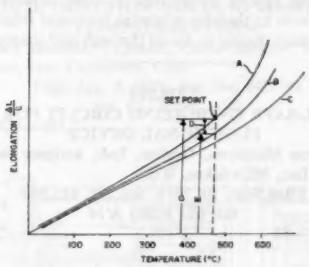
abled to effect operation of said valve means, capacitance means, means connecting said capacitance means to a source of a cyclical AC signal to enable said capacitance means to charge during a portion of alternate cycles of the AC signal, a normally disabled controlled switching device operable when enabled to connect said capacitance means in a circuit path with said switching means to permit said capacitance means to discharge over said switching means, said conrol arrangement further including flame sensing means for controlling the enabling of said controlled switching device, said flame sensing means being responsive to a pilot flame to be operable in a first mode to maintain said controlled switching device disabled for a plurality of cycles of said AC signal to permit said capacitance means to charge to a predetermined value, and to then enable said controlled switching device during the next one of said alternate half cycles of the AC signal to permit said capacitance means to discharge over said switching means to operate said switching means, and to thereafter enable said controlled switching device during each alternate half cycle of the AC signal while the pilot flame remains established to permit said capacitance means to discharge over said switching means during said alternate half cycles of the AC signal to maintain said switching means operated.

4,038,020

PHOTOFLASH LAMP

Emery G. Audesse, and Donald E. Armstrong, both of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Oct. 10, 1975, Ser. No. 622,275
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—93 **8 Claims**



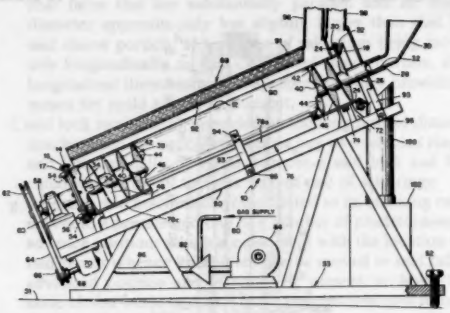
1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a quantity of combustible material located in said envelope;
a combustion-supporting gas in said envelope; and
ignition means attached to said envelope and disposed in operative relationship to said combustible material;
said ignition means including at least one metallic member passing through and sealed in one end of said envelope; and
said envelope comprising a borosilicate glass having a mean coefficient of thermal expansion in the range of about 52 to 55 $\times$ 10^{-7} in./in./° C between 0° C and 300° C and a coefficient of thermal expansion at the set point thereof which is higher than the coefficient of thermal expansion of said metallic member at the setpoint of said glass, whereby the glass about the seal to said metallic member is in a state of radial compression.

4,038,021

CONTINUOUS GRAIN DRIER AND METHOD

John O. Benson, Rte. No. 1, Box 28, Mayer, Minn. 55360

Filed Apr. 5, 1976, Ser. No. 673,934
Int. Cl.[2] F27B *7/08*
U.S. Cl. 432—112 **15 Claims**



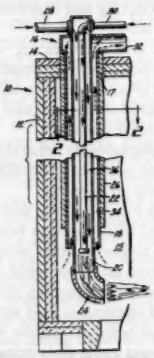
1. A continuous drier including a tubular casing mounted at an inclined axis for containing both a granular product to be dried and a heat transfer media in the form of heat conductive particles, a feed tube having the major longitudinal portion thereof concentrically disposed within said casing for feeding said product through the upper end of said casing into the casing adjacent the lower end thereof, a helical auger rotatable about said inclined axis having its outer edge engaging the interior of said casing and its inner edge engaging said feed tube, at least a portion of said auger having perforations therein of a size generally smaller than the grains constituting said product and generally larger than said particles constituting said heat transfer media so that said heat transfer media can sift downwardly as said product is advanced upwardly, and means for directing heat against the outside of said casing so that at least some of the heat transmitted through said casing is conducted to said product via said heat transfer media.

4,038,022

IN-FURNACE RECUPERATOR

Calvin C. Blackman, 5419 Park Drive, Vermilion, Ohio 44089

Filed June 9, 1975, Ser. No. 585,218
Int. Cl.[2] F23D *11/44*
U.S. Cl. 431—166 **10 Claims**



1. In a furnace having a heating chamber defined by insulated walls and heated by the combustion of a fuel mixed with air delivered from the exterior of the furnace and wherein the air and fuel are supplied to a burner for combustion and the

combustion products are exhausted from the furnace, the improvement which comprises,

a heat recuperator extending beyond the insulated walls disposed within the confines of the furnace heating chamber,

said recuperator including collecting means to collect the products of combustion and cause them to flow from the furnace,

and air conducting means having an inlet positioned to draw air externally from the furnace and an outlet to supply air to the burner,

said air conducting means including heat conducting conduit means disposed in heat exchange relationship with said collecting means,

and insulating means surrounding the exterior of said recuperator within the chamber,

whereby the heat from the combustion products is utilized to preheat the air before the combustion products are exhausted from the furnace.

4,038,023

Patent Not Issued For This Number

4,038,024

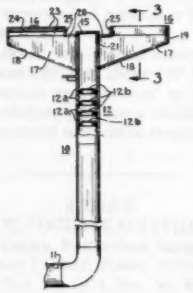
FLARE STACK GAS BURNER

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Dec. 3, 1975, Ser. No. 637,285

Int. Cl.[2] F23C *11/00*

U.S. Cl. 431—202 **3 Claims**



1. A flare stack gas burner for waste combustible gas comprising

a vertical stack pipe closed at the top and with an outwardly extending wall to which combustible gas is supplied for combustion,

a plurality of hollow fixed vanes extending outwardly from said outwardly extending wall and said stack pipe and to the interiors of which the gas from said stack is delivered,

each of said vanes having spaced parallel vertical side walls connected at the bottom by an upwardly and outwardly inclined bottom wall, and

said vanes being of a length of a plurality of times the diameter of the stack pipe, and

means for inducing the air required for the combustion of said gas comprising

a plurality of elongated flat inclined nozzles extending from said vanes for gas to be burned with at least one nozzle for each vane and to which said gas is delivered,

said nozzles extending substantially the lengths of the vanes, and

said nozzles having interior walls extending from the vertical side walls and converging to provide nozzle discharge openings and inducing combustion supporting air between said vanes and on each side of the gas streams discharged from said nozzles.

4,038,025

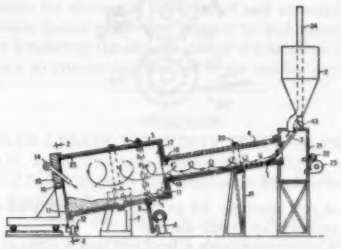
KILNS

Miroslav Kratochvil, Bondi Junction, Australia, assignor to R.M.C. Transport (New South Wales) Pty. Limited, Sydney, Australia

Division of Ser. No. 561,678, March 25, 1975, Pat. No. 3,955,917, which is a continuation-in-part of Ser. No. 431,879, Jan. 9, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,522

Int. Cl.[2] F27B *7/02*

U.S. Cl. 432—13 **10 Claims**



1. A process for producing a light-weight aggregate from lumps of a material such as shale, clay or mud, said process comprising:

introducing said material into an upper end of a rotating substantially cylindrical first chamber having a lower end and an axis which is downwardly inclined;

moving said material through said first chamber into a rotating substantially cylindrical second chamber;

said second chamber having a downwardly inclined axis which is co-linear with the axis of said first chamber;

said second chamber having a diameter which is greater than the diameter of said first chamber and said second chamber having an upper end which is connected to said lower end of said first chamber;

heating said second chamber;

forming a sealing skin about the lumps of said material on entry of said material into said second chamber from said first chamber;

maintaining said second chamber at a substantially higher temperature than said first chamber by reflecting radiant energy exiting from the upper end of said second chamber directly back into the second chamber to maintain the temperature of said second chamber at a temperature which is sufficiently higher than the temperature of said first chamber to form said sealing skin about the lumps of material on their entry into the second chamber;

permitting hot gases from said second chamber to exit from the upper end of said second chamber into said first chamber to heat said first chamber, and

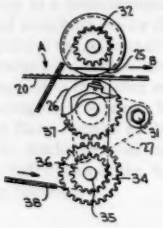
bloating said material within said second chamber after formation of said sealing skin about the lumps of material to provide an aggregate having improved properties of greater resistance to water absorption and higher strength.

4,038,026

ELECTROPHOTOGRAPHIC FUSING APPARATUS

Kenichi Wada, Sakai; Yuji Enoguchi, Higashiosaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai, and Hiroshi Murasaki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 585,709, June 10, 1975, Pat. No. 3,998,584.
This application May 25, 1976, Ser. No. 689,845
Claims priority, application Japan, June 17, 1974, 49-69522; June 15, 1974, 49-68285
Int. Cl.[2] H05B 3/10; G03G 5/00
U.S. Cl. 432—60 4 Claims



1. A heat roll assembly for an electrophotographic copying machine, comprising: frame means;

a pair of rolls comprising a heat roll and a support roll between which a support sheet bearing a toner powder image may pass;

one of said rolls being rotatably mounted on said frame means;

a roller assembly including levers pivotally mounted on said frame means, the other of said rolls being rotatably mounted on said levers for pivotal movement therewith, said roller assembly being pivotally mounted on said frame means for movement between a first position of rotative contact between said rolls and a second position wherein said rolls are spaced apart;

drive means for driving both of said rolls;

shift means including a shaft rotatably mounted on said frame means, said shaft having a cam element thereon in sliding contact with a cam follower mounted on said levers, a sprocket wheel rotatably mounted on said shaft and being in engagement with said drive means, and clutch means on said shaft for coupling the rotation of said sprocket wheel to said shaft for rotation thereof so as to effect movement of said roller assembly between said first and second positions;

means detecting arrival and departure of the support sheet from said rolls;

said shift means being actuated by said detecting means upon the arrival of the support sheet for shifting said other roll from said second to said first positions for rotation by said first roll, and for shifting said other roll to said second position from said first position upon the departure of the support sheet; and

said drive means being operatively connected to both said rolls for rotating said other roll only while in said second position.

4,038,027

CELLULOSIC TEXTILE MATERIALS HAVING IMPROVED SOIL RELEASE AND STAIN RESISTANCE PROPERTIES

John A. Kearney, Macon, Ga., assignor to The Bibb Company, Macon, Ga.

Continuation-in-part of Ser. No. 318,858, Dec. 27, 1972, Pat. No. 3,897,206. This application July 28, 1975, Ser. No. 599,350

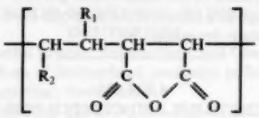
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.[2] **D06M** *13/20*

U.S. Cl. 8—120 **15 Claims**

1. A process for imparting improved soil release and stain resistance properties to cellulosic textile materials which comprises:

a. impregnating a cellulose-containing textile material with a solution of a water-soluble synthetic polymer acid or anhydride and an esterification catalyst said polymer having the recurring unit:



wherein

R_1 is hydrogen or methoxy;

R_2 is hydrogen or an alkyl of 1 to 4 carbons; and provided R_1 and R_2 are not simultaneously hydrogen and when R_1 is methoxy, R_2 is hydrogen;

b. drying the impregnated material at from room temperature to about 300° F;

c. curing the dryed impregnated material at a temperature of from about 250° F to about 410° F for a period of at least 15 seconds and sufficient to react said polymer with said cellulose-containing textile material; and

d. washing the cured material to remove excess unreacted polymer.

4,038,028

SEWAGE SLUDGE-IRRADIATION DEVICE

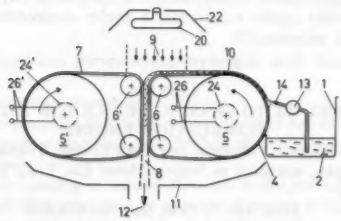
Ulrich La Roche, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 14, 1975, Ser. No. 632,103

Claims priority, application Switzerland, Nov. 20, 1974, 15418/74

Int. Cl.[2] **A61L** *3/00*

U.S. Cl. 21—102 R **16 Claims**



1. An apparatus for irradiating sewage sludge with radiation having a sterilizing effect, comprising:

a conveyor system incorporating means for providing at least two cooperating conveyor devices,

means for supplying and depositing sewage sludge onto at least one of said conveyor devices,

said means for supplying and depositing sewage sludge onto at least one of said conveyor devices comprises a sewage sludge container for supplying the sewage sludge, said at least one conveyor device being structured to cooperate with said sludge container so as to withdraw the sewage sludge therefrom, and spreader means for spreading the withdrawn sludge deposited onto said at least one conveyor device over at least part of a surface thereof, said spreader means forming a substantially coherent thin layer of sewage sludge upon the surface of said at least one conveyor device, said spreader means comprising a material spreading element,

said conveyor devices being positioned relative to one another so as to form therebetween a passageway for the throughflow of the deposited sewage sludge, said passageway defining a mixing gap for the intermixing of the sewage sludge contained therein,

means for establishing a relative movement between said two conveyor devices,

said means for establishing a relative movement between said two conveyor devices comprises at least one drive means for driving at least one of said conveyor devices,

radiation means positioned relative to said conveyor system for irradiating the sewage sludge at a location immediately prior to intermixing thereof in the mixing gap.

4,038,029

LIMULUS LYSATE TURBIDITY TEST FOR PYROGENS

Joseph D. Teller, Freehold, and Kristine M. Kelly, Manasquan, both of N.J., assignors to Worthington Biochemical Corporation, Freehold, N.J.

Filed Jan. 20, 1976, Ser. No. 650,607

Int. Cl.[2] **G01N** *21/00, 33/16;* **C12K** *1/00*

U.S. Cl. 23—230 B **19 Claims**

1. In a method for determining the endotoxin content of an aqueous liquid wherein the protein content of an aqueous lysate of washed amebocyte cells from the blood of the horseshoe crab is coagulated responsive to endotoxin contained in a sample of the liquid, the improvement which comprises admixing a sample of the liquid with lysate which is the product of water lysing washed amebocyte cells, said lysate being buffered at a pH between about 6.5 and about 6.8 and being at a concentration such that 1 ml thereof is reactive with 0.1 ml of an endotoxin solution containing 1 ng per ml of endotoxin to develop upon incubation for 60 minutes at 37° C turbidity that imparts an absorbancy between about 0.07 and about 0.2 at 360 nm, incubating said admixture under temperature and time conditions conducive to an increase in absorbancy resulting from reaction of said lysate with any endotoxin contained in the sample, and determining the absorbancy of the incubated admixture.

4,038,030

PROFILE ANALYSIS PACK AND METHOD

Bill E. Albright, Diamond Bar, Calif.; Michael D'Aquino, and Zindel H. Heller, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

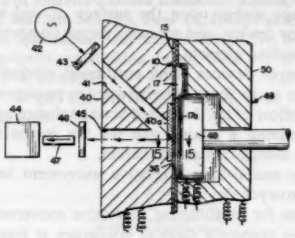
Filed Apr. 10, 1975, Ser. No. 566,921

Int. Cl.[2] **G01N** *33/16, 21/24*

U.S. Cl. 23—230 B **20 Claims**

15. A method for reacting a diluted sample of body fluid with a test reagent capable of reacting with said fluid to produce a fluorescent reaction product, comprising the steps of partially filling a vertically-elongated chamber containing a test reagent with a diluted sample of body fluid, said chamber having one planar and transparent side wall and having a semi-rigid, opaque, and normally generally semi-cylindrical opposing side wall, bracing said planar side wall against a heated first platen and then advancing a second platen into engagement with a lower portion of said semi-rigid side wall to stress the same and reduce the volume of the chamber's lower portion, said semi-rigid side wall being capable of returning by reason of said stress to its original semi-cylindrical condition when said second platen is withdrawn, then withdrawing said second platen so that the lower portion of said semi-rigid wall

returns to its normal semi-cylindrical configuration to relieve said stress, and repeating said advancing and withdrawing steps to mix thoroughly the contents of said chamber while maintaining the same at a preselected reaction temperature,



and thereafter directing a beam of ultraviolet light obliquely through said planar transparent wall and measuring the intensity of the fluorescence emitted by the reaction product back through said planar transparent wall.

4,038,031

TEST COMPOSITION, DEVICE AND METHOD FOR DETECTING BILIRUBIN

Charles T. W. Lam, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 2, 1975, Ser. No. 618,802
Int. Cl.[2] G01N *21/06, 33/16*
U.S. Cl. 23—230 B **33 Claims**

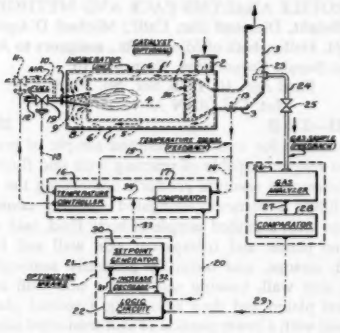
1. A test composition for detecting bilirubin in a urine sample, which composition comprises a diazonium compound which reacts with urinary bilirubin to produce a color change; a constituent capable of producing an acidic pH in said urine sample; and an organic sulfonic acid or an organic sulfonic acid salt adduct of urea or of a derivative of urea, which adduct has a potentiating effect on reaction of said diazonium compound with urinary bilirubin in an acidic environment.

4,038,032

METHOD AND MEANS FOR CONTROLLING THE INCINERATION OF WASTE

Gerald L. Brewer, Rowayton, Conn., and Steven D. Olsen, New Rochelle, N.Y., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 15, 1975, Ser. No. 641,126
Int. Cl.[2] F23G *7/06*
U.S. Cl. 23—230 A **5 Claims**



1. In a process for effecting the incineration of undesired waste gaseous materials, the improved method for automatically adjusting and conserving fuel input to the burner for the incineration zone responsive to changes in the quantity of pollutants content of the waste gas stream being introduced to the incineration zone which comprises:

a. a fuel flow control means operating responsive to process feedback and set point signals,

b. measuring a change in the combustion zone stream leaving the incineration zone,

c. sending an output signal to a set point optimizing means indicative of a change in the combustion gas stream,

d. comparing a feed back signal with at least one predetermined set point level in said optimizing means and generating a signal for a set point change responsive to a differential from the predetermined set point level to make an incremental change in such level and regulate said fuel flow control means to change fuel flow to the burner, whereby fuel input can be decreased for an above normal temperature level and, conversely, increased for conditions of excessive pollutants in the waste gas stream and for a low temperature unstable reaction in the incineration zone, said feed back signal being indicative of a change in the temperature of the combustion gas stream and providing a change in a temperature set point level responsive to a temperature deviation.

4,038,033

SELENIUM LABELLED COMPOUNDS IN THE SATURATION ANALYSIS OF CYCLIC NUCLEOTIDE

Reginald Monks, and Idris Lewis Thomas, both of Amersham, England, assignors to The Radiochemical Centre, Limited, England

Filed Mar. 29, 1976, Ser. No. 671,697
Claims priority, application United Kingdom, Apr. 8, 1975, 14462/75
Int. Cl.[2] C07H *19/10, 19/20;* G01N *33/16*
U.S. Cl. 23—230.3 **1 Claim**

1. In a method of performing a saturation analysis of a cyclic nucleotide by providing a reaction mixture of the cyclic nucleotide to be analysed, a radioactively labelled cyclic nucleotide and a specific reagent for the said cyclic nucleotide, which specific reagent is present in an amount insufficient to combine with all of said cyclic nucleotide and said labelled cyclic nucleotide,

effecting reaction of the reaction mixture, whereby part of the cyclic nucleotide becomes bound to the specific reagent and the remainder of the cyclic nucleotide does not become so bound,

separating the cyclic nucleotide which is bound to said specific reagent from the cyclic nucleotide that is not so bound, and measuring the radioactive concentration of one or both of the bound and the unbound cyclic nucleotide,

the improvement which consists in using as the radioactively labelled cyclic nucleotide, a cyclic nucleotide labelled with selenium-75.

4,038,034

AIR-FUEL RATIO SENSING DEVICE FOR INTERNAL COMBUSTION ENGINE

Yasuo Nakajima, Yokosuka, and Kenji Yoneda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

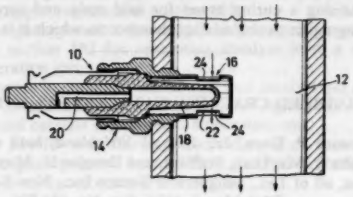
Filed Apr. 7, 1976, Ser. No. 674,673
Claims priority, application Japan, Apr. 8, 1975, 50-42627
Int. Cl.[2] F16K *17/38;* G01N *27/00;* G05D *23/02*
U.S. Cl. 23—255 E **4 Claims**

1. An air-fuel ratio sensing device for an air-fuel ratio control system of an internal combustion engine, comprising:

a sensing element extending into an exhaust gas passageway so as to be exposed to exhaust gases flowing therein;

a housing disposed about the sensing element and arranged to project into the exhaust gas passageway, said housing having a plurality of openings formed at circumferentially spaced positions; and

a plurality of bimetallic valves arranged to flex toward said plurality of openings as the temperature thereof rises, and



to close said plurality of openings when said exhaust gases exceed a predetermined temperature.

4,038,035

APPARATUS FOR ENRICHING HYDROGEN WITH DEUTERIUM

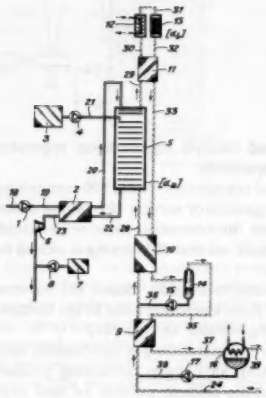
Mehmet Sahabettin Ergenc, Zollikerberg, and Charles Mandrin, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 21, 1974, Ser. No. 472,053

Claims priority, application Switzerland, May 24, 1973, 7403/73

Int. Cl.[2] B01J *8/02, 8/08;* **C01B** *4/00, 5/02*

U.S. Cl. 23—260 **3 Claims**



1. An apparatus for enriching hydrogen with deuterium comprising

at least one isotope exchange column;

means for passing a first flow of fresh water of natural deuterium concentration into and through said column in a first direction;

means for passing a second flow of hydrogen into and through said column in an opposite direction to said first flow;

means for introducing a catalyst into said column to effect an isotope exchange between said flows to enrich the hydrogen with deuterium while introducing steam into said second flow;

at least one heating means downstream of said column relative to said second flow for heating the deuterium enriched hydrogen and superheating the steam;

a reactor means for receiving the enriched hydrogen and superheated steam;

a first conduit connecting an inlet of said reactor means to an outlet of said heating means to receive a flow of the enriched hydrogen and steam from said heating means;

a catalyst in said reactor means for effecting an isotope exchange between the heated hydrogen and superheated steam to further enrich the hydrogen with deuterium;

a second conduit connecting an outlet of said reactor means to an inlet of said heating means to deliver the hydrogen-steam mixture from said reactor means to said heating means;

a condensor downstream of said reactor relative to the flow of the further enriched hydrogen and superheated steam for condensing water from the superheated steam;

means for delivering condensed water from said condensor into said second flow to wet the hydrogen; and

a further heating means for heating the water in said second flow to steam prior to passage into said column.

4,038,036

APPARATUS FOR THE PRODUCTION OF SULFUR FROM MIXTURES OF HYDROGEN SULFIDE AND FIXED NITROGEN COMPOUNDS

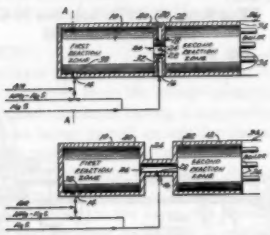
David K. Beavon, Pasadena, Calif., assignor to The Ralph M. Parsons Company, Pasadena, Calif.

Division of Ser. No. 506,305, Sept. 16, 1974, Pat. No. 3,970,743.

This application May 13, 1976, Ser. No. 685,981

Int. Cl.[2] B01J *1/00;* **C01B** *17/04, 17/06*

U.S. Cl. 23—262 **9 Claims**



1. In a thermal reactor for use in sulfur production consisting of a thermal reactor containing two thermal reaction zones in series, wherein the first thermal reaction zone has an inlet for feeding a first hydrogen sulfide feed and a source of oxygen thereto and wherein at least part of the hydrogen sulfide is converted to sulfur dioxide and wherein the second reaction zone has means associated therewith for feeding a second hydrogen sulfide feed thereto and wherein a portion of the formed sulfur dioxide reacts with hydrogen sulfide in the second thermal reaction zone to form sulfur, the improvement which comprises separating the first and second thermal reaction zones by a partition formed of a first transversely positioned planar apertured wall spaced from a second transversely positioned planar apertured wall, said planar walls being joined at their periphery to the external walls of said thermal reactor and extending radially inwardly therefrom, the first planar apertured wall serving a radiating surface to maintain a higher temperature in the first thermal reaction zone than the second thermal reaction zone, the respective apertures of said planar walls being interconnected by a gas flow conduit of a cross-sectional area which provides turbulent gas flow between said first and second thermal reaction zones, said partition being provided with means to introduce the second hydrogen sulfide feed into the gas flow conduit in the thermal reactor for turbulent mixing with the gas stream flowing from the first thermal reaction zone to the second reaction zone.

7. A thermal reactor for use in sulfur production which comprises:

a. a first refractory lined thermal reaction zone for reaction of a first feed of hydrogen sulfide and a source of oxygen to form sulfur dioxide, said first thermal reaction zone having feed inlet at one end thereof for a premixed feed of the first hydrogen sulfide feed and the source of oxygen to the first thermal reaction zone, and at the opposed end

thereof, a first transversely-positioned planar apertured refractory wall providing a radiating surface for maximation of temperature in said first thermal reactor zone and providing an outlet for the reaction products formed in the first thermal reaction zone;

b. a second thermal reaction zone having an inlet formed of a second planar transversely-positioned apertured refractory wall spaced from the first planar apertured refractory wall to define a second thermal zone for operation at a lower temperature than the first thermal reaction zone and means for communication with a waste heat boiler;

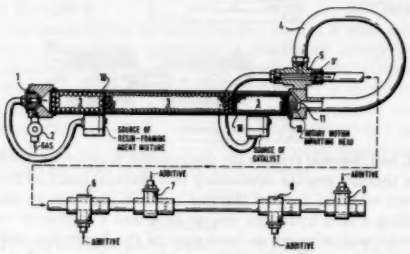
c. a gas flow conduit connecting the apertures of said first and second planar refractory walls forming a turbulent gas flow path between said first and second thermal reaction zones, said gas flow conduit having a plurality of openings around the periphery thereof and a manifold connection to a second hydrogen sulfide feed surrounding said openings for feed of a second hydrogen sulfide feed through the plurality of openings to the gas flowing from said first thermal reaction zone to said second thermal reaction zone.

4,038,037

APPARATUS FOR THE MANUFACTURE OF HOMOGENEOUS, FINE-PORED SYNTHETIC RESIN FOAMS

Hans Wilmsen, deceased, late of Essen, Germany (by Joerg Wilmsen, heir)

Filed Sept. 10, 1974, Ser. No. 504,742
Int. Cl.[2] B01J *8/00*
U.S. Cl. 23—288 R **10 Claims**



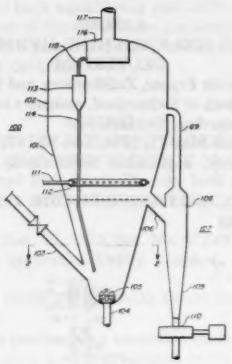
1. Apparatus for the continuous preparation of a homogeneous, fine-pored, cured, synthetic resin foam with additives therein, said apparatus comprising, in combination, a foaming chamber having an inlet and an oulet spaced from said inlet, at least one nozzle at said inlet for directing materials into said foaming chamber, means containing the synthetic resin and a foaming agent connected to said nozzle and supplying said resin and said agent to said chamber, means for supplying gas under pressure to said inlet, said foaming agent, said gas and said resin foaming a foam-resin mixture without a curing agent for said resin in said foaming chamber, a first mixing chamber with a tubular wall and having a nozzle for directing materials into said mixing chamber, a foam-resin mixture inlet and an outlet spaced from said last-mentioned inlet, a circulation hose connected at one end to said outlet of said foaming chamber for receiving said foam-resin mixture from said chamber and connected to said inlet of said mixing chamber for supplying said foam-resin mixture thereto, means connected to said nozzle of said first mixing chamber for supplying a first additive to said nozzle of said first mixing chamber, a second mixing chamber with a tubular wall and having a nozzle for directing materials into said second mixing chamber, an inlet and an outlet spaced from said last-mentioned inlet, interconnecting means interconnecting said outlet of said first mixing chamber to said inlet of said second mixing chamber for supplying said foam-resin mixture with said additive to said second mixing chamber, and means connected to said nozzle of said second mixing chamber for supplying a second additive to said nozzle of said second mixing chamber, each of said first and second chambers being fee interiorly thereof of baffle plates, screws and stiffers and one of said means for supplying an additive comprising means containing a curing agent for said resin and supplying said curing agent to the mixing chamber to which it is connected.

4,038,038

FLUIDIZED CRACKING CATALYST REGENERATION APPARATUS

Dorrance P. Bunn, Jr.; John C. Strickland, both of Houston; John P. MacLean, Stafford, and Douglas H. May, Jr., Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,504
Int. Cl.[2] B01J *8/24;* **B01D** *15/06*
U.S. Cl. 23—288 B **4 Claims**



1. Fluidized catalyst regeneration apparatus, which comprises in cooperation:

a. a vertical regenerator vessel **100** comprising a frusto-conic lower regenerator section **101** having a closed bottom and open top, in communication with a cylindrical upper regenerator section **102** having a closed top and an open bottom;

b. spent catalyst conduit means **103** for transferring spent catalyst from a reaction zone to the bottom portion of said lower regenerator section **101;**

c. primary regeneration gas distribution means for radially distributing an oxygen containing primary regeneration gas into the bottom portion of said lower regenerator section **101;**

d. a regeneration gas conduit **104** in communication with said primary regeneration gas distribution means;

e. secondary regeneration gas distribution means **112** in the upper portion of said lower regeneration section **101** for radially distributing oxygen containing gas into said lower regenerator section **101;**

f. a regenerated catalyst standpipe **107** exterior to said reactor vessel **100,** comprising an upper cylindrical standpipe section **108** having an opening in the side thereof, having a top with an opening therein, and having an open bottom, and a lower conical standpipe section **109** having an open top in communication with the open bottom of said upper cylindrical standpipe section **108** and an open bottom;

g. a regenerated catalyst ductway **106,** having open ends, directed downwardly at an angle of about 45° to 60° from the vertical, wherein the upper end of said regenerated catalyst ductway **106** is in communication with the interior of said lower regenerator section **101** and wherein the lower end of said regenerated catalyst ductway **106** is in communication with regenerated catalyst standpipe **107**

via the opening in the side of upper cylindrical section **108**;

h. a deaeration gas line **69** for providing communication from the top of said upper cylindrical standpipe section **108** to upper regenerator section **102**;

i. catalyst-gas separation means **113** within said upper regenerator section **102** for separating catalyst from a spent regeneration gas;

j. vent means in communication with said catalyst-gas separation means **113** for removing spent regeneration gas from said catalyst regeneration apparatus; and

k. a line **114** for transferring separated catalyst from said catalyst-gas separation means **113** to the bottom portion of said lower regenerator section **101**.

4,038,039

PRODUCTION OF ALUMINA

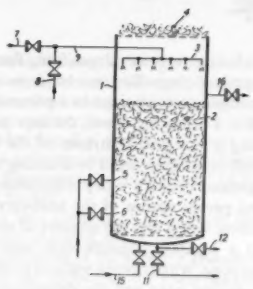
Andrew Nicolson Carruthers, Dollard des Ormaux; John Edward Deutschman, and Michael George Willis, both of Arvida, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed July 6, 1976, Ser. No. 703,005

Claims priority, application United Kingdom, July 7, 1975, 28603/75

Int. Cl.[2] **C01F** *7/06;* **B01D** *9/02*

U.S. Cl. 23—293 R **11 Claims**



1. A procedure for controlling the sodium oxalate level in the liquor employed in the Bayer process for the production of alumina from bauxite ore which comprises concentrating by evaporation a part of the spent liquor recovered from the precipitation stage to render to supersaturated with respect to sodium oxalate, spraying such concentrated liquor onto a packing in an enclosed space to impinge on such packing in the form of rapidly moving droplets, the evaporation of the liquor being continued in the evaporation stage until the sodium oxalate exceeds a critical supersaturation with reference to temperature of droplets at impact on the packing, recovering the sprayed liquor from the enclosed space and recycling said liquor to the process circuit.

4,038,040

FLEXIBLE LATTICE-LIKE GRID STRUCTURE ETCHED FROM A METALLIC FOIL

Werner Nagl, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Oct. 2, 1975, Ser. No. 618,933

Claims priority, application Germany, Oct. 5, 1974, 2447565

Int. Cl.[2] **C23F** *1/02*

U.S. Cl. 428—596 **6 Claims**

1. In a flexible matallic fine grid structure for antenna reflectors with a double curved surface with the grid structure comprising a plurality of web sections interconnected at junction points, said web sections being curved in the plane of the grid and the junction points of said web sections forming the corners of equilateral triangles, wherein the improvement comprises that said web sections being etched from a metal foil, said web sections connecting the junction points having a sinusoidal configuration for the extent of the web sections between junction points, and the ends of at least five web sections forming a junction point.

2. In a flexible metallic fine grid structure for antenna reflectors with a double curved surface with the grid structure comprising a plurality of web sections interconnected at junction points, said web sections being curved in the plane of the grid and the junction points of said web sections forming the corners of equisided, multi-sided closed sections, wherein the improvement comprises that said web sections being etched from a metal foil, said web sections connecting the junction points have a sinusoidal configuration over the extent of the web sections between the junction points.

4,038,041

COMPOSITE INTERLAYER FOR DIFFUSION BONDING

David Scott Duvall, Cobalt, and Daniel Francis Paulonis, Moodus, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1975, Ser. No. 642,627

Int. Cl.[2] **B32B** *15/00*

U.S. Cl. 428—576 **6 Claims**

1. In an interlayer for bonding metallic articles which are based on a metal chosen from the group consisting of nickel, cobalt, and iron, said interlayer having a composition similar to that of the articles being joined, except for the addition of a quantity of at least one melting point depressant, said interlayer having a brittle characteristic because of the formation of brittle phases, the improvement which comprises:

providing the interlayer in the form of a plurality of lamellae, each of said lamellae being free from those combinations of elements which form brittle phases;

whereby the lamellar interlayer is ductile even though its overall composition is one which would be brittle if produced in a homogeneous form.

4,038,042

ELECTROPLATING OF POLYPROPYLENE COMPOSITIONS

Robert L. Adelman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 641,949, Dec. 18, 1975, Pat. No. 4,002,595, which is a continuation-in-part of Ser. No. 428,725, Dec. 27, 1973, abandoned. This application July 22, 1976, Ser. No. 707,634

Int. Cl.[2] **B23P** *3/00;* **C25D** *5/34*

U.S. Cl. 428—625 **13 Claims**

1. A process for electroplating a metal coating onto an article composed of a polyolefin blend comprising

a. 20 to 60 weight percent of propylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the propylene content of said copolymer being at least 92 molar percent,

b. 4 to 20 weight percent of an ethylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the ethylene content of said copolymer being at least 88 molar percent,

c. 1 to 15 **L weight percent of a low polarity rubber having a low enough polarity to result in the electrical volume resistivity of the blend being less than about** 25 ohm-cm in the injection-molded condition,

d. 12 to 45 weight percent carbon black, having an average particle size less than about 40 mμ, and a volatile content of less than about 3 weight percent, at least 15% of the total of said carbon black being a high conductivity black having a dibutyl phthalate oil absorbtion value of at least about 1.00 cc/gm, an iodine adsorption number greater than about 160 mg/g, and

e. optionally up to 45 weight percent silicate mineral additive dispersed in said blend, substantially all of said additive being of a size that will pass through a screen having 44 micron openings, and at least 60% of the particles being smaller than 10 microns in cross sectional dimension, provided that when said mineral additive is used, the combined amounts of mineral additive and carbon black are between 35 and 60% by weight of the blend,

the process comprising

a. molding the composition into articles of desired shape,

b. surface treating the article with a strongly oxidizing solution comprising CrO_3, H_2SO_4 and H_2O,

c. rinsing the surface, and

d. electroplating the treated object.

10. An electroplated made by the process of claim **1.**

11. An electroplated article of claim **10** which has a multiplicity of electroplated layers, one on another.

4,038,043

GASOLINE ADDITIVE COMPOSITIONS COMPRISING A COMBINATION OF MONOAMINE AND POLYAMINE MANNICH BASES

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,728
Int. Cl.² C10L *1/22*
U.S. Cl. 44—75 **19 Claims**

1. A gasoline additive composition comprising a combination of

i. from 20 to 80 weight percent of a monoamine of the formula, Z_nNR_{3-n}, and

ii. from 20 to 80 weight percent of a polyamine of the formula $ZNH(C_xH_{2x}N(R'))_yC_xH_{2x}NHZ$ wherein Z is an alkyl- and hydroxy-substituted benzyl group, the alkyl having 50 to 1000 carbon atoms; R is hydrogen or alkyl of 1 to 18 carbon atoms; and n is 1 or 2; R' is hydrogen or Z with the proviso that at least one R' is hydrogen; x is 2 or 3; and y is 1 to 5.

4,038,044

GASOLINE ADDITIVE COMPOSITIONS COMPRISING A COMBINATION OF DIAMINE AND POLYAMINE MANNICH BASES

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,727
Int. Cl.² C10L *1/22*
U.S. Cl. 44—75 **10 Claims**

1. A gasoline additive composition comprising a combination of

i. from 60 to 75 weight percent of a diamine of the formula $ZNHC_nH_{2n}NHZ$, and

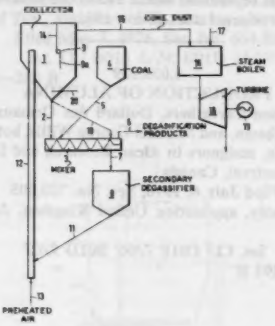
ii. from 25 to 40 weight percent of a polyamine of the formula $Z—NH(C_xH_{2x}N(R'))_y—C_xH_{2x}NH—Z$ wherein Z is an alkyl- and hydroxy-substituted benzyl, the alkyl having 50 to 1000 carbon atoms; R' is hydrogen or Z with the proviso that at least one R' is hydrogen; n is 2 to 6; x is 2 or 3; and y is 1 to 5.

4,038,045

PROCESS FOR DEGASIFYING FINE-GRAINED FUELS

Roland Rammler, Konigstein; Johann Grosse-Heitmeyer, Frankfurt am Main; Hans Sommers, and Heinz Bathke, both of Essen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Ruhrgas Aktiengesellschaft, Essen, both of Germany

Filed Apr. 8, 1976, Ser. No. 675,011
Claims priority, application Germany, June 23, 1975, 2527852
Int. Cl.² C10J *3/12*; C10B *49/16*
U.S. Cl. 48—197 R **26 Claims**



1. In a process for continuously degasifying finegrained coal, wherein a fine-grained degasified residue is recirculated as a heat-carrying medium and is heated in a pneumatic conveyor line and then fed to a collecting vessel, the improvement which comprises feeding a first partial stream of the heat-carrying medium from said collecting vessel to a mixing zone together with said fine-grained coal for a dry distillation of said coal, feeding a second partial stream of the heat-carrying medium from said collecting vessel and the mixture of solids from said mixing zone to a separate degasification zone downstream from said mixing zone, withdrawing volatile products from the mixtures in the mixing zone and the degasification zone and feeding them to dust-collecting and condensing means, recirculating degasified residue from said degasification zone to the pneumatic conveyor line, maintaining the ratio of the rate of the second partial stream to the rate of the first partial stream of the heat-carrying medium between 0.2:1 and 15:1, and discharging degasified residue dust in a particle size of more than 75% below 0.3 mm from said collecting vessel.

4,038,046

COATED ABRASIVE BONDED WITH UREA-FORMALDEHYDE, PHENOLIC RESIN BLENDS

Stanley J. Supkis, Averill Park, N.Y., assignor to Norton Company, Worcester, Mass.

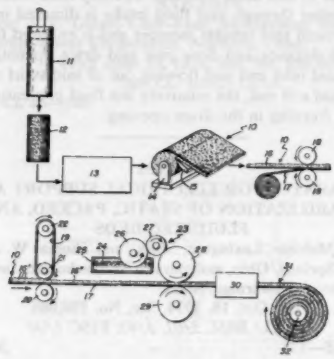
Filed Dec. 31, 1975, Ser. No. 645,522
Int. Cl.² C08J *5/14*
U.S. Cl. 51—295 **7 Claims**

3. An abrasive product comprising abrasive grits bonded to a fibrous backing by a condensation product of a urea formaldehyde prepolymer and a phenolic prepolymer resin, the ratio of phenolic prepolymer solids to urea formaldehyde prepolymer solids being from 9/1 to 1/9, said condensation product includes a particulate calcium carbonate filler.

4,038,047
METHOD OF MAKING A FLEXIBLE RESILIENT ABRASIVE

George L. Haywood, Latham, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 815,942, April 14, 1969, abandoned, and Ser. No. 638,042, May 12, 1967, Pat. No. 3,607,159. This application Aug. 13, 1971, Ser. No. 171,449
Int. Cl.[2] B24D 3/32
U.S. Cl. 51—295 5 Claims



1. In a method of manufacturing a resilient, controlled-density, porous, abrasive material comprising a foam backing member, said method comprising applying to a surface of the foam backing member a composition comprising abrasive grain and binder therefor, the improvement comprising:
   a. forming a self-sustaining cylinder of closely-packed small, resilient foam particles bound one to the other by an adhesive binder;
   b. peeling a thin continuous sheet from the cylinder by a compressive shearing action; and
   c. before application of the abrasive grain-bonding adhesive, subjecting the surface of the foam backing member to a non-compressive shearing action whereby to produce a smooth, porous, surface.

4,038,048
LAPPING COMPOSITION CONTAINING A CARBOXY VINYL POLYMER

Herbert T. Thrower, Jr., 2612C Park Road, Charlotte, N.C. 28209

Continuation-in-part of Ser. No. 549,816, Feb. 14, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 649,014
Int. Cl.[2] C09K 3/14
U.S. Cl. 51—298 R 23 Claims

1. An aqueous lapping composition consisting essentially of:
   a. a lapping gel, said gel comprising from about 0.3 to about 1.25 weight percent of a carboxy vinyl polymer thickener; sufficient base to neutralize said polymer thickener and provide a pH in the range of from about 7 to about 9; at least 0.13 weight percent of a surfactant and water; and
   b. an inorganic grinding grit.

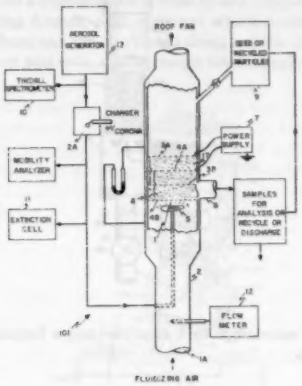
4,038,049
ELECTROFLUIDIZED BEDS FOR COLLECTION OF PARTICULATE

James R. Melcher, Lexington, Mass.; Kenneth S. Sachar, White Plains, N.Y., and Karim Zahedi, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 18, 1974, Ser. No. 516,057
Int. Cl.[2] B03C 3/00
U.S. Cl. 55—2 22 Claims

1. Apparatus for electrostatically removing particulate from a gas, said apparatus comprising means for electrically charging the particulate; a housing containing a bed of particles, means for moving a stream of gas, including gas containing said particulate, into and through said bed with a substantial vertical velocity component for substantially totally fluidizing said bed and maintaining said bed substantially totally fluidized; and

means for imposing an electric field upon the particles of the bed to create an electrofluidized bed, said means being



operable to maintain the electric field intensity sufficiently high to induce substantial positive and negative surface charges at respective ends of said particles but sufficiently low that there is no substantial electrical discharge in the bed region, said charged particulate being electrically attracted by the charged surfaces of the particles of the electrofluidized bed and collected upon the particles of the electrofluidized bed and thereby being removed from the stream.

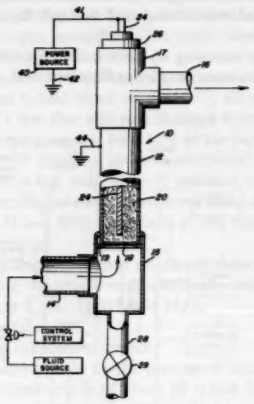
4,038,050
ELECTRICAL SENSING AND REGENERATING SYSTEM FOR MOLECULAR SIEVE DRIERS

Frank Eugene Lowther, Buffalo, N.Y., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 535,282, Dec. 23, 1974, abandoned, and Ser. No. 625,237, Oct. 23, 1975, which is a continuation-in-part of Ser. No. 527,832, Nov. 27, 1974, abandoned. This application June 7, 1976, Ser. No. 694,017
Int. Cl.[2] B01D 53/04
U.S. Cl. 55—18 13 Claims

1. A gas drying system comprising:
   a. an absorbent bed of zeolite particles;
   b. a plurality of spaced apart electrodes in contact with the bed;
   c. means for measuring electrical current flow through the bed between the spaced electrodes and generating a signal representative of adsorbed water content;
   d. means responsive to signal for interrupting gas flow through the bed at a predetermined bed water content; and;
   e. means for applying electrical energy to the bed between the spaced electrodes to regenerate the bed, said electrical

energy being provided by said means at a voltage gradient of about 0.05 to 500 Kv/cm, a current density of about



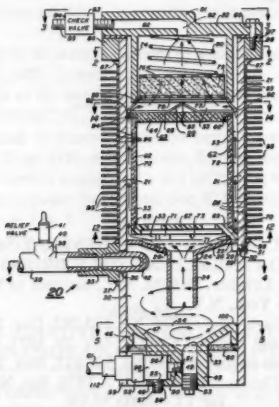
0.001 microamps to 1 amp/cm^2 and a frequency of 0 to 10^3Hz.

4,038,051

AIR CLEANER AND DRYER

Thomas N. Ide, Drexel Hill, Pa., assignor to Stratoflex, Inc., Fort Worth, Tex.

Division of Ser. No. 235,767, March 17, 1972, Pat. No. 3,934,990. This application Nov. 5, 1975, Ser. No. 629,113
Int. Cl.^{2} B01D *45/16*
U.S. Cl. 55—218 **5 Claims**



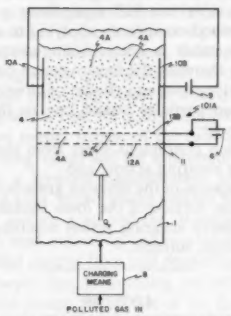
1. Apparatus for cleaning and removing moisture and contaminants from a compressed gaseous fluid, said fluid being received from a compressor and being relatively hot, comprising housing means forming a swirl chamber, a fluid intake formed in said housing means and adapted to receive compressed fluid from the compressor and communicating with said swirl chamber, means directing incoming fluid tangentially in a swirl pattern in said swirl chamber, a tubular member having a fluid flow passage therethrough and positioned generally centrally in said housing, said passage having an inlet end located in said swirl chamber and an exit end and forming a flow passage for said fluid from the upper side of said chamber, a contaminant drain opening formed in said housing means at a low side of said swirl chamber and said housing means being pitched toward said drain opening, normally closed valve means in said drain opening for normally closing said drain opening and causing contaminants and moisture to collect in said drain opening, said valve means being adapted to be periodically opened in order to flush the contaminants and moisture from the drain opening, said inlet end of said passage being located intermediate said fluid intake and said drain opening and at a substantial distance from said fluid intake and relatively close to said drain opening, whereby fluid entering said swirl chamber through said fluid intake is directed in a swirl pattern around said tubular member and is required to flow a substantial distance and flow past said drain opening before entering said inlet end and flowing out of said swirl chamber through said exit end, the relatively hot fluid preventing moisture from freezing in the drain opening.

4,038,052

APPARATUS FOR ELECTRICAL SUPPORT AND STABILIZATION OF STATIC, PACKED, AND FLUIDIZED BEDS

James R. Melcher, Lexington, Mass., and Thomas W. Johnson, Yellow Springs, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 18, 1974, Ser. No. 516,056
Int. Cl.^{2} B03C *3/01, 3/45;* F15C *1/04*
U.S. Cl. 55—138 **20 Claims**



13. Apparatus for electrostatically inducing agglomeration to enhance particulate removal from a gas, that comprises: a duct through which the particulate-carrying gas can flow; means for charging the particulate in the duct; a fluidized bed in the duct comprising semi-insulating particles through which the gas flows; a distributor plate to provide electromechanical support for the bed particles, said distributor plate comprising a grid having a plurality of apertures therethrough, the grid having cross dimensions essentially the same as the cross dimensions of the duct and being disposed in the duct such that the gas must flow through the apertures, said apertures being much larger than the bed particles so that, in the absence of measures to prevent such, the bed particles would drop through the apertures and deplete the bed; means to create an electric field in the apertures of the grid so that the particles making up the bed, though smaller than the apertures in physical size, do not pass through the apertures by virtue at least in part of the influence of the field upon the particles; and means associated with the bed for imposing an electric field upon the particles of the bed to create an electrofluidized bed, said charged particulate being electrically attracted by the charged surfaces of the particles of the electrofluidized bed and collected upon the particles of the electrofluidized bed.

15. Apparatus that comprises, in combination, a bed comprising many semi-insulating particles; and an electromechanical valve to effect valving of the particles, said electromechani-

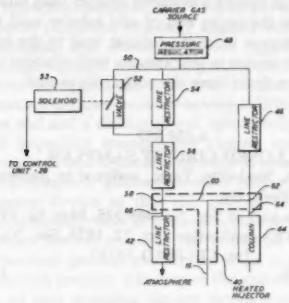
cal valve including, in combination, a member having an aperture therethrough that is much larger in cross dimensions than the cross dimensions of an individual particle, and means to create an electric field in the aperture, the electric field acting to prevent passage of particles through the aperture and being of sufficient intensity to effect prevention of such passage.

4,038,053

METHOD AND APPARATUS FOR INTRODUCING LIQUID SAMPLES INTO A GAS CHROMATOGRAPHIC COLUMN

Marcel J. E. Golay, Clair-Azur, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 10, 1976, Ser. No. 694,809
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—160 **6 Claims**



1. Apparatus for introducing liquid samples into a gas chromatographic column comprising, in combination,

means for supplying a liquid sample to a heated injector in a continuous, uniform and relatively slow-moving flow,

means for vaporizing said sample in the heated injector,

means for passing said vapor through a supply line in said injector to a by-passing restrictor until stationary conditions have been established, and

means for then passing said vapor to the gas chromatographic column for sampling by reversing the flow in said supply line;

said means for supplying a liquid sample to a heated injector in a continuous, uniform and relatively slow-moving flow comprising:

a cylinder having a dispensing outlet coupled to said supply line and an inlet coupled to a liquid sample source,

a plunger mounted in said cylinder,

means for rapidly reciprocating said plunger in said cylinder to aspirate in and then vent said by-passing sample through said restrictor to the atmosphere,

thereby removing substantially all traces of the preceding sample, and

means for slowly advancing said plunger in said cylinder to push said sample into said heated injector and thence for a relatively brief instant into said gas chromatographic column for sampling.

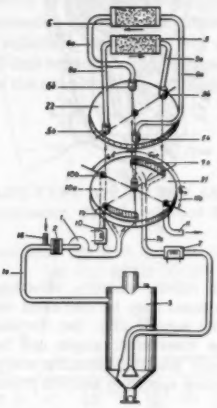
4,038,054

ADSORPTION APPARATUS

Roderich W. Gräff, Kollwitzweg 19, 61 Darmstadt-Arheilgen, Germany

Continuation of Ser. No. 343,915, March 22, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,808
Claims priority, application Germany, Mar. 25, 1972, 2214662
Int. Cl.[2] B01D *53/00, 53/26*
U.S. Cl. 55—179 **7 Claims**

1. An apparatus for drying synthetic plastic particles to be supplied to a plastics processing machine, comprising hopper means for accommodating the particles to be dried; a two-chamber adsorption arrangement for removing moisture from a humid working fluid passing therethrough; duct means communicating with said hopper means and said adsorption arrangement; valve means interposed into said duct means and operative for including at least one of said chambers into a closed adsorption circuit with said hopper means and for selectively including either of said chambers into a regeneration circuit, said valve means including two discs having contact surfaces in sealing contact with one another and being mounted on one another for limited relative angular displacement about a common axis normal to said contact surfaces, said discs being formed with openings which communicate with said surfaces and are distributed along a center located on said axis, said openings alternatingly communicating with the duct associated with the respective chambers and with the respective circuits; blower means in said duct means for passing said humid working fluid from said hopper means through said adsorption circuit to dehumidify said working fluid and for passing a regeneration fluid through said regeneration circuit; and heating means in said duct means and including a first heating arrangement for heating the dehumidified working fluid downstream of the respective chamber that is included in the adsorption circuit so as to convert said dehumidified fluid into fresh working fluid for drying the particles in said hopper means, and a second heating arrangement for heating the fluid upstream of the respective chamber included in the regeneration circuit so as to convert said fluid into a regeneration fluid.



4,038,055

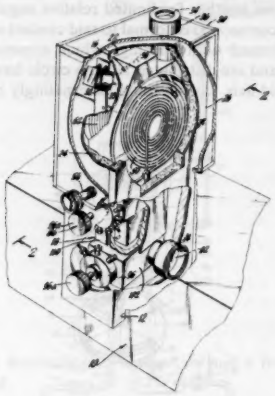
GAS CHROMATOGRAPH FOR CONTINUOUS OPERATION WITH INFRARED SPECTROMETER

Antonio Varano, Philadelphia, Pa., and Reginald Tobias, Watertown, Mass., assignors to Block Engineering, Inc., Cambridge, Mass.

Filed Oct. 10, 1975, Ser. No. 621,404
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—197 **8 Claims**

1. An improved gas chromatograph in combination with an absorption spectrum analyzer, the chromatograph comprising upper and lower cojoined chambers, the lower chamber having measured dimensions, the absorption spectrum analyzer having a measured dimension test sample well, the chromatograph lower chamber being dimensioned to fit within the test sample well; the upper chamber being thermally insulated, provided with heating and thermostat means, the chromatograph further comprising a chromatograph column and an injection port, the column being mounted within the upper chamber and connected at its input to the injection port; a

detector, a sample cell and a plurality of valves, the detector cell and at least two multiport valves being mounted juxtaposed to a heated thermostated metal plate means positioned within the lower chamber; the cell, when mounted to the aforesaid plate being positioned transversally of the lower chamber, short tubular connections between, respectively, the column and valves between the detector and valves, and be-



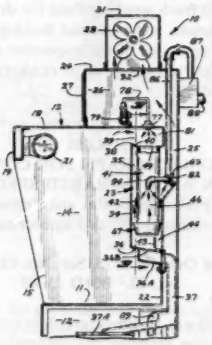
tween the cell and valves, whereby, eluted sample materials emitted by the column may be entrained and momentarily retained within the sample cell, the chromatograph lower chamber with the transverse sample cell being positioned within, yet thermally insulated from the analyzer test sample well, while absorption spectrum analysis procedures are completed.

4,038,056

KITCHEN HOOD APPARATUS FOR SEPARATING FOREIGN MATTER FROM FLUID

Wolodymyr Diachuk, Minneapolis, and Reuben N. Palm, Wayzata, both of Minn., assignors to Century 21 Pollution Control, Inc., Minneapolis, Minn.

Filed Mar. 6, 1975, Ser. No. 555,795
Int. Cl.[2] B01D *47/10*
U.S. Cl. 55—238 **26 Claims**



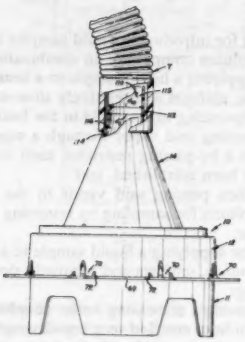
6. An apparatus for separating foreign matter from a fluid carrying the foreign matter comprising: an upright uninterrupted fluid impervious tubular wall defining a passage and an upper fluid inlet end and a lower fluid outlet end open to the passage, helical means for directing the fluid along a helical path through said passage, said helical means comprising a plurality of helical sections being twisted in the same direction and located in end to end relationship and each having terminal edges circumferentially oriented relative to each other to divide the fluid and foreign matter moving through the passage into separate streams whereby when fluid and foreign matter flows through the passage the fluid and foreign matter follows the helical path and is divided in separate streams at each adjacent segment and the foreign matter entrained in the fluid is moved outwardly and in the direction of the flow of fluid through the passage into engagement with said wall, said foreign material being collected on said wall and moved along said wall toward the outlet end, and annular collecting means fixed with respect to the wall located adjacent the outlet end of the wall to collect foreign matter discharged from the walls of said passage at the outlet end of the wall and to permit cleaned fluid to pass centrally thereof, said collecting means having an annular wall surrounding the outlet end of the tubular wall, said annular wall including an inner annular flange surrounding a fluid outlet opening aligned with the outlet end of the passage to permit cleaned fluid to flow through the collecting means, said flange having a diameter smaller than said passage and spaced from the outlet end of said tubular wall whereby foreign matter moves from the tubular wall to the collecting means, and drain means in said annular wall to allow collected foreign matter to drain from the collecting means.

4,038,057

CLOSED CIRCUIT SAMPLER

Thomas P. Roth, Nashville, Tenn., assignor to Andersen 2000, Inc., College Park, Ga.

Continuation-in-part of Ser. No. 469,325, May 13, 1974, Pat. No. 3,922,905. This application Oct. 22, 1975, Ser. No. 624,652
Int. Cl.[2] B01D *53/30*
U.S. Cl. 55—270 **10 Claims**



1. A sampling device for separating entrained particles from the pressurized gaseous medium output of a positive pressure device, the positive pressure device having an outlet tube with a prescribed diameter discharge opening therein from which the pressurized gaseous medium output is discharged, said sampling device comprising:

an impaction member including a generally circular jet plate and a seamless annular resilient impaction sealing flange integral with said jet plate about the periphery thereof, said jet plate having an impaction centerline, an upstream side, a downstream side and a prescribed plate diameter larger than the diameter of the discharge opening in the outlet tube, said impaction member defining a plurality of jet impaction passages therethrough to direct the gaseous medium along spaced paths generally parallel to said first centerline from the upstream side of said impaction member to the downstream side of said impaction member to divide the flow of the gaseous medium into a plurality of impaction jet streams, said annular impaction sealing flange concentric about said impaction sealing flange and extending away from the upstream side of said jet plate, said impaction sealing flange further defining an inside outwardly flaring impaction sealing surface concentric

about said impaction centerline increasing in diameter in a direction away from the upstream side of said jet plate;

a collection member means positioned adjacent the downstream side of said jet plate and defining a collection surface thereon facing the downstream side of said jet plate so that the impaction jet streams will be directed against the collection surface on said collection member means and at least a portion of the particles of a prescribed diameter range entrained in the gaseous medium will be jet impacted onto the collection surface of said collection member means;

a base support member positioning said collection member means with respect to said jet impaction passages so that said collection surface is generally parallel to the downstream surface of said jet plate and operatively associated with said jet impaction passages to cause the particles in the gaseous medium to be jet impacted onto said collection surface as the gaseous medium is forced through said jet impaction passages, said base support member having a support centerline coaxially aligned with said impaction centerline, and defining a base support outlet therethrough through which the gaseous medium passes after impaction against the collection member;

a connector-diffuser member having a diffuser centerline, an inlet end and a discharge end operatively associated with said impaction member for placing said jet impaction passages in said impaction member in communication with the pressurized gaseous medium output of said positive pressure device so that the gaseous medium output is forced through said jet impaction passages by said positive pressure device to cause the entrained particles in said pressurized gaseous medium to be jet impacted onto said collection member whereupon the gaseous medium passes out of said sampling device through said base support outlet, said connector diffuser member including an annular seamless diffuser side wall defining a diversing central diffuser passage therethrough which diverges from the inlet end to the discharge end of said connector-diffuser member, said inlet end defining an inlet opening therein to said central diffuser passage smaller in diameter than the discharge opening in the outlet tube of the positive pressure device so that the outlet tube can be pressed onto the inlet end of said connector-diffuser member to seal the outlet tube to the inlet end of said connector-diffuser member and place the discharge opening in the outlet tube in sealed communication with said diffuser passage in said connector-diffuser member through the inlet opening thereto, said discharge end defining an outlet opening therein from said central diffuser passage, said connector-diffuser member including a resilient, outwardly projecting sealing bead integral with said diffuser side wall at the discharge end thereof, said sealing bead concentric about said diffuser centerline and defining a seamless bead sealing surface thereon outboard of said diffuser side wall, said bead sealing surface having an outside diameter larger than the smallest diameter of said impaction sealing surface but smaller than the largest diameter of said impaction sealing surface so that when the discharge end of said connector-diffuser member is forced toward the upstream side of said jet plate of said impaction member with the diffuser centerline coaxial with the impaction centerline, said bead sealing surface on said connector-diffuser member will sealingly engage said impaction sealing surface of said impaction sealing flange on said impaction member to seal the outlet opening from said connector-diffuser member to the upstream side of said jet plate of said impaction member; and,

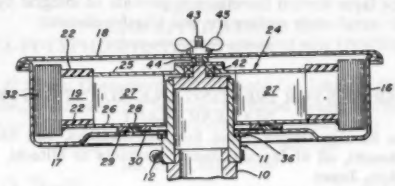
locking means for maintaining said sealing bead on said connector diffuser member in sealing engagement with said impaction sealing flange on said impaction member, said locking means including first resilient catch means carried by the discharge end of said connector-diffuser member and second resilient catch means carried by said impaction member, said first and second resilient catch means constructed and arranged to be resiliently deflected past each other as the discharge end of said connector-diffuser member is forced toward the upstream side of said jet plate and to resiliently snap back into interference with each other when said sealing bead is in sealing relationship with said impaction sealing flange to lock said connector-diffuser member onto said impaction member in a sealed relationship therewith so that when the discharge opening in the outlet tube from the positive pressure device is sealingly pressed onto the inlet end of said connector-diffuser member, the pressurized gaseous medium output from the positive pressure device will be forced through said diffuser passage in said connector-diffuser member, then through the the impaction passages in said impaction member against said collection member means to cause at least a portion of the particles of a prescribed diameter range entrained in the gaseous medium to be jet impacted onto the collection surface of said collection member means and thus separated from the gaseous medium, and then out of the sampling device through said base support outlet.

4,038,058

ROTARY-TYPE AIR FILTER ASSEMBLY

Leonard A. Miskiewicz, 219 Sprucewood St., Pittsburgh, Pa. 15210

Filed Mar. 22, 1976, Ser. No. 668,848
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—317 **10 Claims**



1. In an air filter assembly for the carburetor of an internal combustion engine wherein the carburetor is coupled to an air discharge port in the bottom wall of a filter housing having a top wall and an annular side wall which includes an inlet opening for the passage of air into the housing and wherein said housing encloses a renewable filter cartridge having a web of filtered material supported between top and bottom annular walls such that the filtering surface of said web faces toward said side wall, the improvement including the combination of:

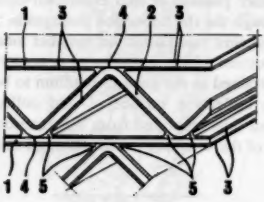
a pedestal extending upwardly from the bottom wall of said filter housing and in flow communication with said air discharge port, said pedestal having a tubular shape formed by a side wall with at least one opening therein to conduct filtered air into the carburetor, and

a carrier frame, and means rotatably supporting said frame on said pedestal for rotation of the carrier frame within said filter housing, said carrier frame including an upper cover joined to a bottom cover by spacer members disposed to form at least one passageway to conduct filtered air between the upper and lower covers into said opening in the side wall of said pedestal, said bottom cover having an annular support surface to receive and support said bottom annular wall of said renewable filter cartridge, said upper cover having an annular outer edge received through the opening defined by said top and bottom annular walls of said renewable filter cartridge whereby filtered air passing from said web flows into the passageway between the cover plates of said carrier frame, said spacer members including impeller means for contacting a current of air within said filter housing for rotating said carrier frame together with said renewable filter cartridge.

4,038,059
HUMIDITY AND HEAT EXCHANGER APPARATUS, AND METHOD FOR ITS MANUFACTURE

Ove Strindehag, and Erik Wrangel, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 22, 1976, Ser. No. 651,589
Claims priority, application Sweden, Jan. 30, 1975, 7500987; Nov. 24, 1975, 7513148
Int. Cl.[2] B01D *53/16*
U.S. Cl. 55—388 6 Claims

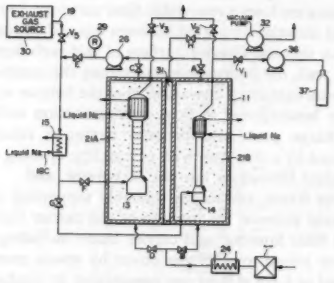


1. In regenerative humidity and heat exchanger apparatus comprising transfer elements having hygroscopic surfaces movable into heat and humidity exchange alternately with two different zones of fluid, the improvement wherein each of said transfer elements comprises an interior body portion of non-hygroscopic oxidizable metal having an exposed oxidized surface layer formed therefrom to provide an integral hygroscopic metal oxide surface for said transfer element.

4,038,060
APPARATUS FOR TREATING AN EXHAUST GAS FROM NUCLEAR PLANT

Kunio Kamiya; Hideo Yusa; Fumito Nakajima, and Masato Takeuchi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 419,006, Nov. 26, 1973, abandoned.
This application Apr. 23, 1975, Ser. No. 570,884
Claims priority, application Japan, Dec. 1, 1972, 47-119903
Int. Cl.[2] B01D *53/04;* C01B *23/00;* F25J *3/00;* G21C *19/32*
U.S. Cl. 62—36 3 Claims

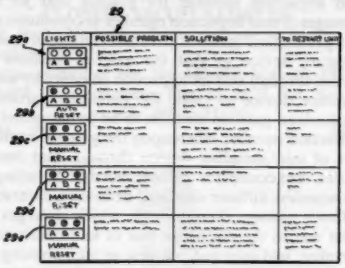


1. In an apparatus for treating exhaust gases which include a radioactive gas, said apparatus comprising cryogenic liquefaction and distillation means for liquefying and distilling the radioactive gas from the exhaust gases, radioactive gas recovering means, conduit means for conveying exhaust gases to be treated to the inlet means of said cryogenic liquefying and distilling means from a source of gases to be treated and for conveying treated gases from an outlet means thereof to the recovery means, the improvement wherein said cryogenic liquefaction and distillation means comprises a plurality of distillation units which are disposed within a casing that is divided into a plurality of chambers which respectively enclose each unit of the cryogenic distillation means and which provide an airtight seal around the cryogenic distillation means, a vacuum compartment disposed between each of said chambers so as to increase the thermal insulation effect between the chambers, and a heat insulating material having adsorbent properties packed into said chambers and surrounding the distillation units, said adsorbent material being a particulate material selected from the group of active carbon, silica gel, synthesized zeolite and activated alumina, said particulate adsorbent having a specific surface area greater than 100 m^2/g and being capable of adsorbing the radioactive gas in the event that there is any leakage of the radioactive gas from the cryogenic distillation means during the recovery operation thereby to prevent accidental escape of the radioactive gas upon occurrence of the leakage.

4,038,061
AIR CONDITIONER CONTROL

Richard M. Anderson, Smyrna; Robert S. McGill, III, Murfreesboro, and Robert W. Ramsey, Nashville, all of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Dec. 29, 1975, Ser. No. 645,281
Int. Cl.[2] H02K *7/10;* F25B *49/00*
U.S. Cl. 62—126 17 Claims



1. In a control system for an air conditioner refrigerant compressor comprising:

a control means for controlling connection of said compressor to an electrical power source; a sensing means connected to said control means for monitoring the voltage of said source and current flow from said source to said compressor, said sensing means being arranged to prevent said control means from energizing said compressor when said source voltage is below a preselected minimum and said sensing means being arranged to cause said control means to deenergize said compressor when said current flow to said compressor exceeds a preselected maximum;

a time delay means connected to said control means for delaying operation of said control means to connect said compressor to said power source for a predetermined period of time upon each de-energization of said compressor and upon each occurrence of a voltage below said preselected minimum voltage;

a temperature sensing means arranged to monitor air conditioner operating temperature conditions, said temperature sensing means being connected to said control means to cause said control means to de-energize said compressor upon the occurrence of temperatures beyond one or more preselected levels until said control means is manually reset; and

a manual reset means connected between said power source and said control system for permitting said control means to connect said compressor to said power source after said predetermined period of time has elapsed;

the improvement comprising first indicator means connected to said control means and arranged to provide an indication that said control system is energized but that said control means is prevented from energizing said compressor until said predetermined period of time has

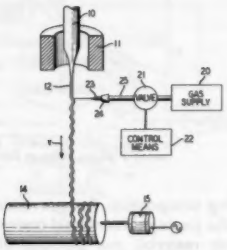
elapsed; and second indicator means connected to said temperature sensing means and arranged to provide an indication that said temperature sensing means has determined a temperature beyond one or more of said preselected levels and that said control means must be reset by said manual reset means.

4,038,062

METHOD AND APPARATUS FOR INTRODUCING GEOMETRICAL PERTURBATIONS IN OPTICAL FIBER WAVEGUIDES

Herman Melvin Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1976, Ser. No. 670,107
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 **9 Claims**



1. A method of introducing controlled geometrical perturbations along a conventional optical fiber waveguide comprising the steps of:

advancing the optical fiber waveguide through the energy emanating from a heat source, while simultaneously

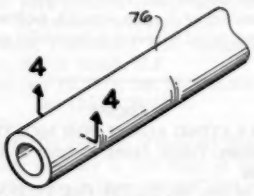
modulating the intensity of the energy from the heat source in a predetermined sequence and in a relationship to the speed at which said optical fiber is being advanced through said energy to concurrently heat the optical fiber waveguide to at least within its working temperature and deform the fiber waveguide with the energy from the heat source to yield the desired controlled geometrical perturbation pattern along the waveguide.

4,038,063

METHOD AND APPARATUS FOR MAKING CONTINUOUS FOAM GLASS PRODUCT

Tudor Williams, Studio City, and John D. Bost, Culver City, both of Calif., assignors to E. C. P., Inc., El Segundo, Calif.

Filed Dec. 17, 1975, Ser. No. 641,810
Int. Cl.[2] C03B *19/08*
U.S. Cl. 65—22 **12 Claims**



1. A continuous, moldless process for the manufacture of cellular ceramic product in which a foaming agent is added to a ceramic feed, said foaming agent requiring a temperature in excess of 500° C for activation, comprising:

transporting a first amount of said ceramic feed through a first kiln section and heating said first feed amount in said first kiln section to a first temperature of at least 500° C but which is lower than said activation temperature;

transporting said heated first feed amount into a second kiln section while transporting a second amount of said ceramic feed through said first kiln section and heating said second feed amount to said first temperature;

adding foaming agent to said heated first feed amount after passage of said first feed amount through said first kiln section to form a mixture thereof;

heating said mixture of foaming agent and said heated first feed amount to said activation temperature in said second kiln section for a time sufficient to form a first amount of foamed ceramic;

transporting said first amount of foamed ceramic while it is at or above its softening point to a drawing kiln section while transporting said heated second feed amount into said second kiln section;

adding foaming agent to said heated second feed amount after passage of said second feed amount through said first kiln section to form a mixture thereof;

heating said mixture of foaming agent and said heated second feed amount to said activation temperature in said second kiln section for a time sufficient to form a second amount of foamed ceramic; and

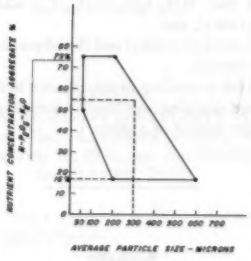
transporting said second amount of foamed ceramic while it is at or above its softening point to said drawing kiln section and forming said product from said first and second amounts of foamed ceramic.

4,038,064

FOLIAR APPLICATIONS OF UREA-POLYPHOSPHATE-POTASSIUM SOLUTIONS TO CROPS

John G. Clapp, Greensboro, N.C.; Donald Lee Johnson, Omaha, Nebr., and James Earl Sansing, Jr., Baton Rouge, La., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Aug. 7, 1975, Ser. No. 602,714
Int. Cl.[2] C05B *15/00*
U.S. Cl. 71—29 **21 Claims**



1. A process for improving the yield of soybeans which comprises the step of treating the foliage of such soybeans with a solution consisting essentially of the following nutrient constituents:

a. H_2O: 25 – 84% (expressed as weight);
b. Urea: 3 – 25% (expressed as % N by weight);
c. Predominantly linear polyphosphate having from 55 to 80% of the P_2O_5 present in the form "pyro," "tripoly" or higher linear polyphosphate: 5 – 30% (expressed as P_2O_5 by weight);
d. Potassium: 5 – 30%, (expressed as K_2O by weight);
e. Ammoniacal N: Less than 3%;
f. Cl: Less than 2%;
g. SO_4: Less than 2%;
h. Other micronutrients such as sulfur, boron, zinc, iron, manganese and copper: None to nominal amounts as desired; said solution being applied in a fine spray during the period starting shortly before flowering and ending shortly after beginning of pod development; and at a rate

of at least 25 pounds aggregate $N—P_2O_5—K_2O$ per acre in the following proportions:

Component	Rate of Application, Lbs./Acre
Urea (as N)	2 - 60
Phosphorus (as P_2O_5)	2 - 75
Potassium (as K_2O)	2 - 75

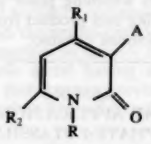
4,038,065

1-ALKYLPYRID-2-ONE

Wayne O. Johnson, Warminster; Michael C. Seidel, Chalfont, and Harlow L. Warner, Hatboro, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 11, 1974, Ser. No. 513,987
Int. Cl.[2] C07D *213/80;* A01N *9/22*
U.S. Cl. 71—76 7 Claims

1. A compound of the formula



wherein

A is the group

wherein Y is halo, NH_2, OH, or (C_1–C_7) alkoxy;

R is (C_1–C_{12}) alkyl, and

R_1 and R_2 are methyl or ethyl and the physiologically acceptable salts thereof.

6. A method for producing preemergence herbicidal activity which comprises applying an effective amount of a compound of claim 1 to the habitat of a plant.

4,038,066

METHOD OF STRIPPING BASE METALS FROM FUSED SALTS

Malcolm Charles Evert Bell, Sudbury; Thijs Eerkes, and Ramamritham Sridhar, both of Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 24, 1974, Ser. No. 482,249
Claims priority, application Canada, July 13, 1973, 176365
Int. Cl.[2] C21B *15/00*
U.S. Cl. 75—29 25 Claims

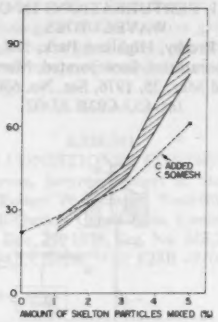
1. A process for recovering at least one base metal value selected from the group nickel, cobalt, copper and iron, dissolved as a chloride in a fused chloride solvent consisting of at least one salt selected from the group consisting of alkali and alkaline earth metal halides which comprises contacting the fused chloride solvent containing the base metal chloride with a precipitant comprising hydrogen sulfide to precipitate base metal values in an easy to separate molten phase and to regenerate the fused chloride solvent.

4,038,067

CARBON-FREE CASTING POWDER FOR INGOT CASTING AND CONTINUOUS CASTING

Hidemaro Takeuchi, Hikari, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed June 8, 1976, Ser. No. 693,901
Claims priority, application Japan, June 13, 1975, 50-71694
Int. Cl.[2] C21C *7/00;* C22B *9/10*
U.S. Cl. 75—257 9 Claims



1. A casting composition for preventing carburization of steel during the casting thereof, said composition comprising a powdery basic material, and particles of a nitride material contained in said basic material as a skeleton therefor, said nitride material being in particle size of 50 mesh or finer, said basic materials containing substantially no carbon particles.

4,038,068

METHOD OF MELTING COPPER ALLOYS WITH A FLUX

Derek E. Tyler, Cheshire, Conn.; David W. Dickinson, Hinckley, Ohio, and James E. Dore, Ballwin, Mo., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 19, 1976, Ser. No. 659,241
Int. Cl.[2] C22B *15/00, 9/00;* C22C *9/01*
U.S. Cl. 75—76 11 Claims

1. Improved method for making copper base alloys containing from 2 to 12% aluminum which comprises:

a. providing a molten mass of a copper base alloy containing from 2 to 12% aluminum, balance copper;

b. covering the mass with an essentially continuous flux layer of molten salt consisting essentially of from 10 to 90% by weight of potassium chloride and from 10 to 90% by weight sodium chloride, said salt having a melting point of from 660° to 800° C;

c. charging additional amounts of said copper alloy to the melt through said flux layer to melt same in the molten mass; and

d. casting said copper base alloy to ingot,

whereby the amount of dross is reduced, molten metal cleanliness is improved, metal recovery is improved and metal losses reduced.

4,038,069

HEAT-INSULATING AGENT FOR MOLTEN METAL

Masaru Takashima, Tokyo, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 515,755, Oct. 17, 1974, abandoned.
This application Jan. 26, 1976, Ser. No. 652,017
Claims priority, application Japan, Oct. 17, 1973, 48-115853
Int. Cl.[2] C22B *9/00*
U.S. Cl. 75—96 5 Claims

1. A heat-insulating agent for molten metal which comprises a burned material containing about 5 to 30% by weight carbon which is obtained by light-burning a dehydrate of sludge dis-

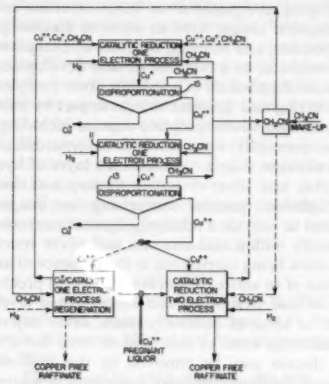
charged in pulping or paper-making procedures, said sludge containing pulp fibers, lignin and chemicals conventionally employed in pulping processes, said dehydrate containing about 60 to 90% by weight water and about 10 to 40% by weights solids, said solids including about 40 to 80% by weight organic material and about 20 to 60% by weight ash.

4,038,070

LOW TEMPERATURE AND PRESSURE CONTINUOUS REDUCTION OF COPPER IN ACID SOLUTIONS

Alkis S. Rappas, Arlington, and J. Paul Pemsler, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,390
Int. Cl.[2] C22B *15/12*
U.S. Cl. 75—108 65 Claims



1. A process for recovering copper values from an acidic solution of solubilized cupric ions comprising:

a. reducing the cupric ions with hydrogen in the presence of a solid hydrogenation catalyst and in the presence of a cuprous ion stabilizing ligand to produce a soluble cuprous ion complex;

b. terminating said hydrogenation reaction before copper metal precipitates on the solid catalyst;

c. separating the aqueous acidic solution which contains the soluble ligand stabilized cuprous complex produced during the hydrogenation of step (a) from the solid catalyst; and

d. disproportionating the cuprous ions in said ligand stabilized cuprous complex to produce copper metal and cupric ions.

4,038,071

PROCESS FOR THE REMOVAL OF MERCURY FROM AQUEOUS SOLUTIONS

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed July 14, 1976, Ser. No. 705,239
Int. Cl.[2] C22B *43/00*
U.S. Cl. 75—108 12 Claims

1. The process for the removal of mercury from an aqueous solution containing mercury in the form of mercuric ions, organo-mercuric ions, or mixtures thereof that comprises the steps of

a. contacting the solution with a reducing agent selected from the group consisting of hypophosphorous acid, phosphorous acid, and the water-soluble salts of hypophosphorous acid and phosphorous acid in an amount sufficient to reduce the ions in the solution to mercury and

b. separating mercury from the aqueous solution.

4,038,072

ALUMINUM-BASE ALLOY

Ivan Filippovich Kolobnev, 1 Spaso-Nalivkovsky pereulok, 19, kv. 12, and Georgy Yakovlevich Mishin, 1 Institutsky proezd, 8, kv. 35, both of Moscow, U.S.S.R.

Filed May 5, 1975, Ser. No. 574,459
Int. Cl.[2] C22C *21/16*
U.S. Cl. 75—142 5 Claims

1. An aluminum-base alloy, consisting essentially of the following elements in wt.%: cerium, from 4.0 to 6.0; copper, from 2.0 to 4.0; silicon, from 1.0 to 3.0; manganese, from 0.7 to 2.0; zirconium, from 0.05 to 0.5; and magnesium, from 0.1 to 0.3, aluminum being the balance.

4,038,073

NEAR-ZERO MAGNETOSTRICTIVE GLASSY METAL ALLOYS WITH HIGH SATURATION INDUCTION

Robert Charles O'Handley, Morris Plains; Ethan Allen Nesbitt, Beach Haven, and Lewis Isaac Mendelsohn, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 1, 1976, Ser. No. 662,639
Int. Cl.[2] C22C *19/07*
U.S. Cl. 75—170 5 Claims

1. A magnetic alloy that is at least 50% glassy, having the formula $(Co_xFe_{1-x})_aB_bC_c$, where B is boron and C is carbon and where x ranges from about 0.92 to 0.96, a ranges from about 78 to 85 atom percent, b ranges from about 10 to 22 atom percent and c ranges from 0 to about 12 atom percent, with the proviso that the sum of b and c ranges from about 15 to 22 atom percent, said alloy having a value of magnetostriction of essentially zero.

4,038,074

METAL ALLOY COMPOSITION

Daniel M. Davitz, Niles, Ill., assignor to Astro, Niles, Ill.

Filed July 19, 1976, Ser. No. 706,473
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 4 Claims

1. An alloy having a chemical analysis on a weight percent basis consisting essentially of:

Nickel	63.0	–	74.8
Chromium	17.0	–	21.9
Molybdenum	2.5	–	5.0
Cobalt	1.0	–	5.0
Silicon	2.0	–	3.0
Tin	1.0	–	5.0
Indium	0.5	–	2.0
Boron	1.00	–	3.00
Copper	0.00	–	5.00
Iron	0.005	–	1.00

said alloy having a melting point of about 2200° F (1204° C), and a casting temperature of about 2300° F (1260° C), and said alloy being characterized by a lower melting point, a lower casting temperature, a higher fluidity at said casting temperature, greater adhesion for a sintered silicate-containing materials and for a fused silicate glass materials and a softer more workable surface than the alloy would otherwise have without the said tin and indium.

4,038,075

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Robert Joseph Pollet, Vremde; Francis Jeanne Sels, Kontich, and Camille Angelina Vandeputte, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 13, 1976, Ser. No. 648,721

Claims priority, application United Kingdom, Jan. 22, 1975, 2866/75

Int. Cl.[2] G03C *7/00, 7/16, 5/30*

U.S. Cl. 96—22 10 Claims

1. A method of developing a photographic silver halide element containing imagewise developable silver halide by means of a silver halide developing solution wherein the developing solution contains a derivative of a polyethylene glycol or a C_1–C_5 monoalkyl ether thereof corresponding to the formula:

$$R_1O(CH_2CH_2O)_nX—A—Y—R_2$$

wherein

R_1 is hydrogen, C_1–C_5 alkyl or the group X—A—Y—R_2

n is an integer of at least 4

X is CO, SO_2, CONH or, when R_1 is X—A—Y—R_2 may be a chemical monovalent bond,

A is alkylene or arylene,

Y is a sulphur or selenium atom, and

R_2 is an alkyl group.

4,038,076

PROCESS FOR PRODUCING ELECTROSTATOGRAPHIC PRINTS

Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 274,394, July 24, 1972, Pat. No. 3,926,824. This application Mar. 25, 1975, Ser. No. 561,959

Int. Cl.[2] G03G *13/14*

U.S. Cl. 96—1 SD 17 Claims

1. A process for producing positive and negative prints from both positive and negative originals, comprising:

forming an electrostatic latent image from said original; developing the electrostatic latent image with a developer having only one type of finely divided toner particles and only one type of carrier therefor the carrier particles being larger than the toner particles, at least the surface of said carrier comprising material which is capable of imparting both a negative and a positive charge to said toner whereby said toner electrostatically adhering to said carrier is both negatively and positively charged on said carrier, whereby toner of one polarity is deposited in the image area and toner of the other polarity is deposited in at least the background area immediately adjacent the image area without providing two or more types of toner and/or carrier particles; and transferring toner of one polarity to a receiving surface to produce a positive or negative print.

10. A process for producing positive and negative prints from both positive and negative originals, comprising:

forming an electrostatic latent image from said original; developing said electrostatic latent image with a developer having both negatively and positively charged toner and carrier therefor, the toner being charged positively by the carrier and the toner being charged negatively by the carrier, whereby toner of one polarity is deposited in the image area and toner of the other polarity is deposited in at least the background area immediately adjacent the image area, and transferring toner of one polarity to a receiving surface to produce a positive or negative print.

4,038,077

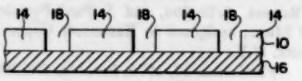
PROCESS COMPRISING DIFFUSION TRANSFER SILVER IMAGE REMOVAL

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 457,854, April 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 676,510, Oct. 19, 1967, abandoned. This application Mar. 10, 1976, Ser. No. 665,562

Int. Cl.[2] G03C *5/54;* G03F *7/02;* G03C *5/00;* B41M *5/00*

U.S. Cl. 96—29 R 17 Claims



1. A process comprising

a. developing an exposed silver halide emulsion containing a developable image, with an aqueous alkaline processing composition, and forming, in terms of unexposed areas of said emulsion, as a function of said development, an image-wise distribution of a soluble silver complex;

b. transferring said complex at least in part by imbibition, to a superposed silver-receptive stratum including a hydrophilic, essentially water-insoluble macroscopically continuous siliceous matrix disposed on a layer of hydrophobic material, said silver-receptive stratum and said layer of hydrophobic material comprising an image-receiving element to provide a relatively dense silver transfer image primarily within said stratum, said silver transfer image formation being carried out in the presence of an effective amount of an anti-adhesion reagent which precludes adhesion of said stratum to said hydrophobic layer therebeneath in areas of relatively dense silver deposit so that nonadhering areas of said stratum with the silver deposited therein may be removed by the application of an aqueous medium consisting essentially of water; and

c. contacting said silver-receptive stratum containing said silver transfer image with an aqueous medium consisting essentially of water for a time sufficient to remove those of areas of said stratum containing relatively dense silver deposits.

4,038,078

PROCESS USING SUCTION TO FORM RELIEF IMAGES

Kiyomi Sakurai, Neyagawa, and Yasuyuki Takimoto, Takatsuki, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed July 28, 1975, Ser. No. 599,930

Claims priority, application Japan, Apr. 19, 1975, 50-47641

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—35.1 8 Claims

1. A process for formation of a relief image which comprises exposing a portion of a layer of a photosensitive composition provided on the surface of a support material to light through a negative to cure the exposed portion of the photosensitive composition and thereafter developing the image by eliminating the unexposed uncured photosensitive composition by suction, the photosensitive composition being a liquid composition containing no unsaturated polymeric material and having at least one addition polymerizable unsaturated monomer selected from the group consisting of C_7–C_{20} alkyl acrylates and methacrylates, poly(C_2–C_3) alkylene glycol diacrylates and dimethacrylates having 9 to 14 alkylene glycol units, C_1–C_3 alkoxypoly(C_2–C_3) alkylene glycol acrylates and methacrylates having 9 to 14 alkylene glycol units, hydroxy (C_2–C_3) alkyl acrylates and methacrylates, monoacryloyloxy (C_2–C_3) alkyl and monomethacryloyloxy(C_2–C_3) alkyl phthalates, and hydroxy(C_2–C_3) alkyl acryloyloxy(C_2–C_3) alkyl and methacryloyloxy(C_2–C_3)alkyl phthalates and at least one photopolymerization initiator, the initiator being present in an amount effective to photopolymerize the unsatuated monomer when the photosensitive composition is exposed to light.

4,038,079
PROCESS FOR THE REGENERATION OF PHOTOGRAPHIC BLEACH-FIX BATHS

Heinz Meckl, Schildgen; Helmut Hüseler, Leverkusen, and Adolf Seiler, Hitdorf, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 244,949, April 17, 1972, abandoned. This application Aug. 21, 1975, Ser. No. 606,722
Claims priority, application Germany, July 27, 1971, 2137549
Int. Cl.[2] G03C *5/26, 5/32*
U.S. Cl. 96—60 BF 2 Claims

1. The method of desilvering a photographic bleach-fix bath, containing accumulated dissolved silver and also containing an iron (III) complex of aminopolyacetic acid,
by contacting the bath with metallic iron,
the improvement which comprises treating the bath containing the iron (III) complex of aminopolyacetic acids in a preliminary reduction step with a reducing agent, selected from the group consisting of dithionites, phosphites, hypophosphites, boronates, water-soluble hydrazine derivatives, hydroxylamines, ascorbic acid, semicarbazide, carbohydrazide, formamidine sulvinic acid and sulfinic acid before the bath is contacted with the metallic iron,
said preliminary reduction step being carried out by adding the said reducing agent to the bath in order to reduce the iron (III) complex until the iron (III) complex is essentially reduced to the iron (II) complex and before a reduction of the dissolved silver,
and after this preliminary reduction step then desilvering the bath by metallic replacement.

4,038,080
FIX AND BLEACH-FIX BATH DESILVERING

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 21, 1972, Ser. No. 290,972
Int. Cl.[2] G03C *5/26, 5/32, 5/38*
U.S. Cl. 96—60 BF 4 Claims

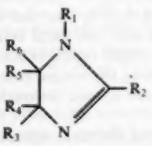
1. A method for desilvering a used photographic fix or bleach-fix bath which comprises adding at least one compound from the group consisting of ascorbic acid, araboascorbic acid, and 4-o-sulfophenyl-2-hydroxytetronimide to a used fix or bleach-fix bath containing complexed silver in an amount sufficient to precipitate the silver in solution and thereby precipitating said silver, wherein at least 12g of the compound are added per liter of used fix bath and wherein at least 15g of the compound are added per liter of used bleach-fix bath.

4,038,081
DEVELOPMENT METHOD

Teiji Habu; Tomio Nakajima, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Feb. 24, 1976, Ser. No. 661,046
Claims priority, application Japan, Feb. 28, 1975, 50-24689
Int. Cl.[2] G03C *5/26, 5/30, 1/06, 1/28*
U.S. Cl. 96—66.3 9 Claims

1. A development method for an image-wise exposed light-sensitive silver halide photographic material which comprises developing, by a developing agent, the photographic material in the presence of a compound represented by the following formulas:


(I)

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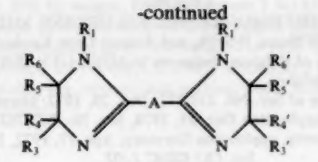
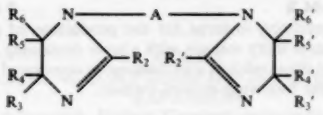

(II)


(III)

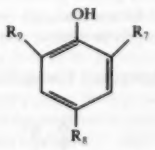
wherein R_1 and R_1' are individually hydrogen, halogen, hydroxyl, or a substituted or unsubstituted alkyl, aralkyl, alkenyl, amino, aryl or acryl group; R_2 and R_2' are individually hydrogen, hydroxyl, or a substituted or unsubstituted alkyl, aralkyl, alkenyl, aryl, hydrazino, heterocyclic, alkylthio or aralkylthio group; R_3, R_3', R_4, R_4', R_5, R_5', R_6 and R_6' are individually hydrogen, alkyl, aryl or a heterocyclic group; and A is a divalent atomic group said compound being present in the material or in a developer bath of the developer composition.

4,038,082
IMAGE-RECEIVING MATERIAL FOR COLOR DIFFUSION TRANSFER COMPRISING PVA AND POLYMETHYLOL COMPOUNDS

Takashi Yoshida, and Nobuo Yamamoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 30, 1974, Ser. No. 501,934
Claims priority, application Japan, Aug. 30, 1973, 48-97633
Int. Cl.[2] G03C *1/40, 7/00;* B44D *1/44, 1/09*
U.S. Cl. 96—77 8 Claims

1. An image-receiving element for color diffusion transfer photography for use with a photographic element containing at least one silver halide emulsion layer having incorporated therein a dye image-forming material that is soluble in alkaline solution and becomes diffusible upon development of the silver halide emulsion layer with an alkaline processing solution, and to which the dye image-forming material is imagewise transferred when the alkaline processing solution is spread between the image-receiving element and the photographic element; in which the image-receiving element comprises a support having at least one layer thereon, at least one layer of the image-receiving element being a hydrophilic image-receiving layer consisting essentially of polyvinyl alcohol or a mixture of at least 50 weight percent polyvinyl alcohol and one or more natural or other synthetic polymers and a polymethylol compound selected from the group of polymethylol compounds represented by the general formula (III)


(III)

wherein R_7, R_8 and R_9 each represents a hydrogen atom, a methylol group or an alkyl group and at least two of R_7 to R_9 are methylol groups and wherein said layer containing said polymethylol compound also contains a non-volatile acid as a cross-linking promoter.

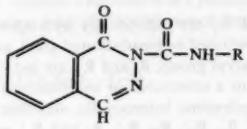
4,038,083

PHOTOTHERMOGRAPHIC RECORDING SHEET

Jozef Frans Willems, Wilrijk, and Antoon Leon Vandenberghe, Hove, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 319,773, Dec. 29, 1972, abandoned. This application Dec. 31, 1974, Ser. No. 537,763
Claims priority, application Germany, Apr. 27, 1972, 2220618
Int. Cl.[2] G03C *1/02*
U.S. Cl. 96—94 R **7 Claims**

1. Image-receiving material for the production of photographic copies in a dry manner with a layer containing a non-light-sensitive silver salt and a phthalazinone compound corresponding to the following general formula:



wherein:
R represents C_{1-18} alkyl group or a cyclopentyl or cyclohexyl group, or a phenyl or naphthyl group.

4,038,084

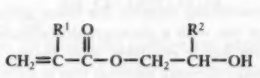
PHOTO-SETTING COMPOSITION

Tsunetomo Nakano; Kazuaki Nishio; Toshikazu Hayashi, and Hiroshi Andou, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Mar. 24, 1976, Ser. No. 669,839
Claims priority, application Japan, Apr. 8, 1975, 50-41790
Int. Cl.[2] G03G *1/68*
U.S. Cl. 96—115 P **10 Claims**

1. A photo-setting composition comprising:

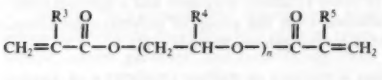
A. 100 weight parts of a product prepared by esterifying a maleic anhydride adduct of a liquid polybutadiene with a hydroxyl compound (i) having the formula



in which R^1 and R^2 are the same or different and each represents hydrogen or methyl, said adduct having an acid value of from 120 to 250 and a viscosity at 50° C. of from 2,000 to 100,000 centipoises;

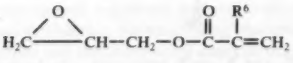
B. 10 – 150 weight parts of one or more than one kind of unsaturated compound selected from the group consisting of

a hydroxyl compound (i), identified above, a di(meth)acrylate compound having the formula



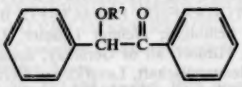
in which R^3, R^4 and R^5 are the same or different and each represents hydrogen or methyl, and n is an integer of 1 – 4 and

a glycidyl monoester compound having the formula



in which R^6 represents hydrogen or methyl;
and

C. 0.5 – 10 weight parts of a benzoinether compound having the formula



in which R^7 represents an alkyl group containing 1 – 3 carbon atoms.

4,038,085

METHOD OF TREATING ELECTROLESS NICKEL PLATING BATH

William G. Scannell, Hinsdale, Ill., assignor to Chromium Industries, Inc., Chicago, Ill.

Filed Mar. 3, 1976, Ser. No. 663,264
Int. Cl.[2] C23C *3/02*
U.S. Cl. 106—1 **4 Claims**

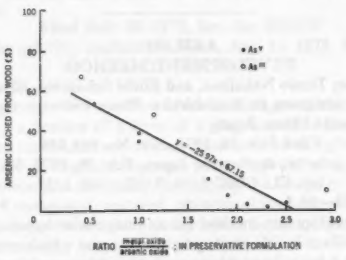
1. The method of treating a chemical nickel plating solution during the plating process to maintain solution integrity and increase the plating rate, said solution including an aqueous solution of nickel ions in concentrations of about 1.5 ounces per gallon of solution, sodium hypophosphite in concentrations of about 2.7 ounces per gallon of solution, a compound selected from the group consisting of sodium acetate and sodium citrate in concentrations of about 1–1.5 ounces per gallon of solution, and a compound selected from the group consisting of lactic acid and glycolic acid in amounts sufficient to adjust the pH of the solution to about 5, said method comprising: adding to the solution sodium fluoride in quantities of not less than about 0.5 ounces per gallon of solution sufficient to cause the formation of a precipitate; and filtering the precipitate from the solution whereby the control and integrity of the bath are maintained.

4,038,086

AQUEOUS AMMONIACAL ZINC ARSENIC OR ZINC/COPPER ARSENIC WOOD PRESERVATIVE SOLUTIONS

Michael R. Clarke, and Jaromir R. Rak, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 362,104, May 21, 1973, Pat. No. 3,945,835. This application Apr. 16, 1975, Ser. No. 568,789
Claims priority, application Canada, Dec. 12, 1972, 158685
Int. Cl.[2] C09D *5/14*
U.S. Cl. 106—15 R **13 Claims**



1. A wood treating composition comprising an aqueous solution containing:

a. soluble component adapted to form a normally water-insoluble compound of zinc or zinc and copper with arsenic acid or arsenious acid, the metal being present in an amount of 0.1–4% by weight (as Zn or Zn + Cu metal) of the total aqueous solution, the weight ratio of zinc or zinc and copper (as oxides) to arsenic (as oxides) being 1.5 or more;

b. 0.15–10% by weight of the total aqueous solution of a water repellent component comprising at least one of

carbonate and bicarbonate ions, in an amount of up to 150% of the zinc or zinc and copper, the weight ratio of $CO_2/NH_3/Zn/As$ or of $CO_2/NH_3/Zn+$ Cu/As being 1.7–2.3/5.9–6.7/1.9–2.9/0.9; and

c. ammonia, in an amount of 1–28% by weight of the total aqueous solution; the ammonia being sufficient to solubilize the normally water-insoluble salts of zinc or zinc and copper and the normally water-insoluble water repellent component.

4,038,087

VARNISH FOR PRINTING INKS AND ITS METHOD OF PREPARATION

Hiroyuki Sugisaki, Tokyo; Mitsuo Nozue, Kuwana, and Hiroki Ogawa, Tokyo, all of Japan, assignors to Taniguchi Petroleum Refining Company, Limited and T. S. Chemical, Ltd., Tokyo, both of, Japan

Filed Nov. 10, 1975, Ser. No. 630,683
Claims priority, application Japan, Mar. 3, 1975, 50-25835
Int. Cl.[2] C07C *139/06;* C09D *11/02, 11/12*
U.S. Cl. 106—32 17 Claims

1. A varnish for a printing ink which comprises a mineral oil and a product prepared by adding an anionic surfactant to an acid sludge, neutralizing said acid sludge with an aqueous solution of an alkali metal salt and then, adding an inorganic polyvalent metal salt to the mixture to form polyvalent metal salts of said anionic surfactant and acid components of said acid sludge.

4,038,088

MOLD RELEASE AGENT

John R. White, Wadsworth; Ram M. Krishnan, Monroe Falls, and James D. Wolfe, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 10, 1975, Ser. No. 557,193
Int. Cl.[2] B28B *7/36*
U.S. Cl. 106—38.24 5 Claims

1. A mold release containing a solution of a sodium or potassium soap of a fatty acid having the structure $C_nH_{2n-1}COOH$ or $C_nH_{2n+1}COOH$ where n is an integer having values of 11 to 22 and 99 to 95 percent by weight of a diluent consisting of alcohol or alcohol and water with the amount of water varying from 0 to 24 percent by weight and the alcohol being selected from the group consisting of methanol and ethanol, isopropanol, and a polyurethane cayatlyst selected from the class consisting of secondary amines, tertiary amines and organo tin compounds.

4,038,089

PROCESS FOR PRODUCING VITREOUS FIBERS CONTAINING CEMENT AS MAJOR CONSTITUENT

Kyosuke Kawai, Fujisawa, Japan, assignor to Japan Inorganic Material Co., Ltd., Japan

Continuation of Ser. No. 384,409, Aug. 1, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 640,777
Claims priority, application Japan, June 19, 1973, 48-68987
Int. Cl.[2] C03C *13/00, 3/04*
U.S. Cl. 106—50 3 Claims

1. A process for producing vitreous fibers containing cement as a major constituent, consisting essentially of mixing the following components in the form of powders:

40 to 50% by weight, Portlant cement; 2.5to 25% by weight, zircon flour; and 40 to 48% by weight, shirasu, having a composition of 65 to 73% SiO_2, 12 to 16% Al_2O_3, 1 to 3% Fe_2O_3, 2 to 4% CaO, 2 to 4% K_2O, and 3 to 4% Na_2O; melting the mixture and making fibers from the molten mixture.

4,038,090

ION EXCHANGEABLE GLASS HAVING LOW THERMAL EXPANSION

Georg Gliemeroth, Finthen, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Dec. 2, 1975, Ser. No. 636,843
Claims priority, application Germany, Dec. 2, 1974, 2456894
Int. Cl.[2] C03C *3/10, 21/00*
U.S. Cl. 106—53 21 Claims

1. In organic vitreous material suitable for ion exchange wherein the refractive index of this material can be changed in the zone of the exchange without any significant change in the linear thermal expansion coefficient, said material consisting essentially of (in percent by weight):

SiO_2	47 – 61	CaO	0 – 5
Al_2O_3	13 – 20	Li_2O	3 – 10
La_2O_3	1 – 8	Na_2O	6 – 16
Ta_2O_5	0 – 7.5	K_2O	0 – 6
ZrO_2	0 – 4	PbO	0.5 – 15
WO_3	0 – 3	TiO_2	0 – 4
BaO	0 – 5	P_2O_5	0 – 3
ZnO	0 – 5	B_2O_3	0 – 5
MgO	0 – 5	Fining Agent.	

4,038,091

SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, April 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974. Pat. No. 3,967,973, said Ser. No. 511,202, is a continuation of Ser. No. 246,316,. This application Dec. 3, 1975, Ser. No. 637,351
Int. Cl.[2] C03C *3/10, 3/12*
U.S. Cl. 106—53 7 Claims

1. In a PbO containing sealing glass frit for sealing two glass surfaces together, the improvement wherein the PbO in said sealing glass is prevented from being reduced when said sealing glass is being fired in the presence of reducing conditions at a temperature sufficient to seal said glass surfaces together, said improvement comprising incorporating an inorganic nitrate, having a thermal decomposition temperature of about 30°–600° C, a melting point of about 36°–264° C and containing water of hydration, in said sealing glass in a powder form and in an amount sufficient to prevent reduction of the PbO in said sealing glass during sealing in the presence of said reducing condition, without the formation of bubbles in said fired sealing glass and wherein said inorganic nitrate is compatable with the fired sealing glass.

4,038,092

STRENGTHENING REACTION SINTERED SILICON NITRIDE

Hans R. Baumgartner, Worcester, Mass., and Stephen D. Skrovanek, Allentown, Pa., assignors to Norton Company, Worcester, Mass.

Filed Jan. 30, 1976, Ser. No. 653,648
Int. Cl.[2] C04B *35/58, 35/70;* F27B *9/04*
U.S. Cl. 106—73.4 5 Claims

1. In a process for increasing the strength of a previously formed reaction sintered silicon nitride body wherein the surface of the formed body is impregnated with a aluminum oxide (Al_2O_3) and fired in a nitrogen atmosphere at a temperature between about 1200° and about 1500° C, the improvement which comprises maintaining a substantial partial pressure of SiO in the atmosphere during said firing.

4,038,093

CEMENT COMPOSITION FOR HIGH TEMPERATURE WELLS AND METHODS FOR PRODUCING THE SAME

Fred A. Brooks, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Oct. 14, 1975, Ser. No. 622,294
Int. Cl.[2] C04B *7/353*
U.S. Cl. 106—93 5 Claims

1. A composition suitable for cementing high temperature wells comprising a hydraulic cement wherein at least about 20 percent of the surface area of the dry grains of said hydraulic cement are coated with a film of a crosslinked hydroxyalkyl cellulose which has been polymerized on to the surface of said cement grains and which is effective to retard the rate of set of said cement.

3. A method of retarding a hydraulic cement used for high temperature wells which comprises coating at least about 20 percent of the surface area of the dry grains of said hydraulic cement with a film of crosslinked hydroxyalkyl cellulose by polymerizing said hydroxyalkyl cellulose in a nonaqueous medium on to the surface of said cement grains without appreciably admixing said hydroxyalkyl cellulose with said grains, said film being effective to retard the rate of set of said hydraulic cement.

4,038,094

MOLDING COMPOSITION

Herman H. Bondi, 1224 SE. Henry, Portland, Oreg. 97202

Continuation-in-part of Ser. No. 632,669, Nov. 17, 1975, abandoned, which is a division of Ser. No. 492,473, July 29, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,667
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—99 4 Claims

2. A molding composition in dry form consisting essentially of about one and one-half parts by volume of casting plaster containing at least 80% calcined gypsum with a particle size fine enough that all particles pass a No. 30 sieve and at least 90% pass a No. 100 sieve, about one part by volume of Portland cement, about seven-eights part by volume of sand with a mesh size in the range of 16 to 24 mesh, and about one-half to two parts by volume of fiberglass fibers having discontinuous lengths of about ¾-inch.

4,038,095

MIXTURE FOR PAVEMENT BASES AND THE LIKE

John Patrick Nicholson, Toledo, Ohio, assignor to Nicholson Realty Ltd., Sylvania, Ohio

Filed May 11, 1976, Ser. No. 685,430
Int. Cl.[2] C04B *1/00*
U.S. Cl. 106—118 8 Claims

1. A mixture consisting essentially of fly ash, lime stack dust and aggregate which through pozzolanic reactions produces hard, strong, durable mass capable of supporting surfacing.

4,038,096

BITUMINOUS EMULSION-MINERAL AGGREGATE COMPOSITIONS CONTAINING SILANES AS ADHESION PROMOTERS

Peter E. Graf, Orinda, and Robert J. Schmidt, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1973, Ser. No. 331,425
Int. Cl.[2] C08L *95/00;* C09D *3/24*
U.S. Cl. 106—277 9 Claims

1. A surfacing composition comprising (A) 100 parts by weight of a mineral aggregate, (B) the residuum from 3 to 150 parts by weight of a bituminous emulsion comprising (1) about 50 to 80 percent by weight of a bituminous binder, (2) from about 0.1 to about 5.0 percent by weight of a water soluble emulsifier, and (3) water to make 100 percent by weight of the emulsion, and (C) from 0.0001 to 0.05 parts by weight of a silane of the formula:

$$R^b - R^a - Si - X_3$$

wherein

1. represents halogen or alkoxy,
2. R^a represents alkylene, and
3. R^b represents amino or aminoalkylene amino.

4,038,097

MODIFIED CLAY PAPER COATING

James T. Traxler, Evanston; Emil Patrick Lira, Des Plaines, and John F. Kraemer, Chicago, all of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Mar. 14, 1975, Ser. No. 558,491
Int. Cl.[2] C09C *1/28, 1/40*
U.S. Cl. 106—288 B 7 Claims

1. A modified clay composition for use in pressure-sensitive duplication systems, said composition comprising montmorillonite clay having aluminum chloride bonded thereto, at least 30% of said aluminum chloride being hydrolyzed, whereby the image formed by reacting said composition with a color-developing substance has increased fade resistance upon exposure to light.

4,038,098

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTRIFICE USE AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 285,966, Sept. 5, 1972, Pat. No. 3,928,541. This application Dec. 22, 1975, Ser. No. 642,977
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.[2] C09C *1/30*
U.S. Cl. 106—288 B 9 Claims

1. A method for producing an amorphous precipitated silicic acid having improved chemical and physical properties including high abrasiveness and low wet cake moisture content prior to the drying thereof, said process comprising the steps of:

1. contacting an aqueous solution of an alkali metal silicate with an alkali or alkaline earth metal salt to prepolymerize said alkali metal silicate and form an aqueous solution of prepolymerized alkali metal silicate solution;
2. combining an acid with an adduct material selected from the group consisting of the water soluble salts of aluminum and alkaline earth metals to form an acidulating solution;
3. acidulating said prepolymerized aqueous alkali metal silicate solution with said acidulating solution by addition of the solution to said prepolymerized silicate solution;
4. continuing the addition of said acidulation solution to said aqueous silicate solution until the precipitation of said silicic acid is complete; and
5. separating and recovering the precipitated silicic acid;

wherein said adduct material combined with said mineral acid is effective to control the refractive index of the precipitated silicic acid and form an alumino or alkaline earth metal silicate.

4,038,099

RUTILE-COATED MICA NACREOUS PIGMENTS AND PROCESS FOR THE PREPARATION THEREOF

Carmine V. DeLuca, Jr., Peekskill; Harold A. Miller, White Plains, and George R. Waitkins, Croton-on-Hudson, all of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Aug. 30, 1971, Ser. No. 176,335

Int. Cl.[2] C09C *1/00*

U.S. Cl. 106—291 **10 Claims**

9. A process for the preparation of a nacreous pigment which comprises in sequence:

a. treating micaceous particles with an aqueous, acidic solution containing a tin compound;

b. coating said micaceous particles with titanium dioxide by deposition from a titanium compound containing coating bath;

c. calcining said particles at an elevated temperature to produce a translucent coating of rutile form titanium dioxide on the micaceous particles.

4,038,100

CHAR COMPOSITION AND A METHOD FOR MAKING A CHAR COMPOSITION

Charles E. Haberman, Tarzana, Calif., assignor to The Oil Shale Corporation (Tosco), Los Angeles, Calif.

Continuation-in-part of Ser. No. 578,338, May 16, 1975, abandoned. This application Aug. 14, 1975, Ser. No. 604,874

Int. Cl.[2] C01B *31/08*; C09C *1/44*

U.S. Cl. 106—307 **11 Claims**

1. A char material produced from rubber containing polymeric hydrocarbons and carbon black by simultaneously pyrolyzing and grinding said rubber in the absence of oxygen with heat carrying solids having a sufficient temperature and for a sufficient length of time to volatilize and depolymerize the hydrocarbons and produce a solid char material of very fine particle size, separating said volatilized and depolymerized hydrocarbons from said char particles, and cooling said char particles in the absence of oxygen to a temperature of less than 400° F., said cooled char particles being free of oxidation, substantially free of non-decomposed rubber and coke, having not been contacted with acid or bases, and having a benzene discoloration No. of greater than 70%.

4,038,101

REACTIVE PIGMENTS AND METHODS OF PRODUCING THE SAME

Thomas D. Thompson, Flemington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Continuation-in-part of Ser. No. 586,558, June 13, 1975, Pat. No. 3,980,492. This application May 4, 1976, Ser. No. 683,077

The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.[2] C09C *1/42*; B41M *5/22*

U.S. Cl. 106—308 N **15 Claims**

1. A reactive pigment for manifold copy systems consisting essentially of a mixture of a member from the group consisting of metal ions and hydrogen ion, a ligand, a member selected from the group consisting of bentonite and montmorillonite and a kaolinite.

4,038,102

ASPHALT COMPOSITIONS HAVING IMPROVED ADHESION TO AGGREGATE

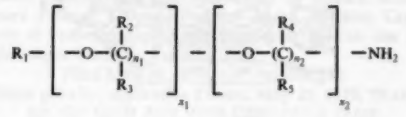
Martin Edvin Hellsten, Odsmal; Anders William Klingberg, and Stig Erick Svennberg, both of Stenungsund, all of Sweden, assignors to Mo Och Domsjo, Ornskoldsvik, Sweden

Division of Ser. No. 353,271, April 23, 1973, Pat. No. 3,928,061. This application June 13, 1975, Ser. No. 586,664

Int. Cl.[2] C08K *5/06, 5/17*

U.S. Cl. 106—316 **3 Claims**

1. An additive for improving the adhesion of asphalt to aggregate comprising an ether amine having the general formula:



wherein:

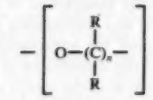
R_1 is a hydrocarbon group having from about six to about sixteen carbon atoms, selected from the group consisting of alkyl and alkenyl;

R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and alkyl radicals having from one to about two carbon atoms;

n_1 and n_2 are numbers within the range from one to about four;

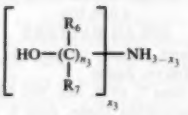
x_1 and x_2 are numbers within the range from zero to about five, the sum of x_1 and x_2 being from one to five;

the total number of carbon atoms in each



unit being from one to about four;

and an alkanolamine having the formula:



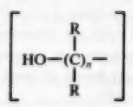
wherein:

R_6 and R_7 are selected from the group consisting of hydrogen and alkyl groups having from one to about two carbon atoms;

n_3 is a number within the range from two to about four;

x_3 is a number within the range from one to about three;

the total number of carbon atoms in each

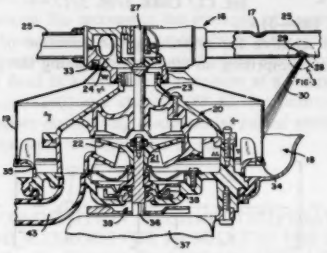


unit being with the range from two to four.

4,038,103
DISHWASHER FILTER FLUSHING SYSTEM

Ernst Grunewald, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed July 27, 1976, Ser. No. 709,169
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—10 10 Claims



10. In a washing machine including a sump at the bottom of a wash chamber and a drain in the sump, a method of flushing food particles from the wash chamber and its contents while draining, including the steps of:

introducing washing liquid into the sump,

converting the washing liquid in the sump into spray form by means of a recirculating pump, having an inlet in the sump for recirculating liquid from the sump into the chamber, and a spraying device to clean the food particles from items contained in the wash chamber,

filtering food particles from the liquid prior to its reentering the inlet of the recirculating pump by means of a screen having a vertical axis and a substantially vertically extending side wall and thereby trapping food particles on the side wall, and,

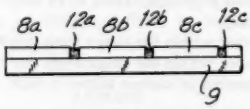
draining the sump after completion of a desired period of liquid recirculation and maintaining recirculation of the liquid during draining, the improvement comprising:

orbiting a downwardly-directed jet of the liquid in a circular path coincident with the screen axis and spraying the jet against the exterior of the screen with sufficient velocity and at an angle of incidence with respect thereto to flush trapped food particles downwardly toward the bottom of the sump for draining from the washing machine.

4,038,104
SOLAR BATTERY

Otake Tsutomu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,564
Claims priority application Japan, June 9, 1975, 50-6995
Int. Cl.[2] H01L 31/04
U.S. Cl. 136—89 P 7 Claims



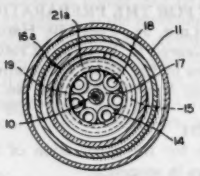
1. A solar battery comprising a plurality of solar cells, and a substrate on which said cells are mounted with channels therebetween, said channels between adjoining cells being up to about 40 μ in width, and being at least equal in depth to the thickness of said solar cells.

2. The solar battery as defind in claim 1, wherein said channels contain an insulating material.

4,038,105
RADIATION SHIELDS FOR ASPIRATING PYROMETERS

Raymond L. Brandeberry, Toledo; Glen J. Lehr, Oregon, and Denzil W. Stacy, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 8, 1975, Ser. No. 620,717
Int. Cl.[2] H01L 35/02
U.S. Cl. 136—231 6 Claims



1. A heat shield for shielding a thermocouple of an aspirating pyrometer from radiant heat comprising:

a. an elongated first refractory tube;

b. a series of second elongated refractory tubes of smaller diameter circumferentially arranged around and bonded to the inside surface of said first tube forming a central passage and a series of parallel passages surrounding the central passage;

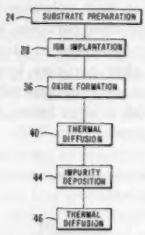
c. a tubular holder bonded to said first tube for attaching said refractory tubes to the aspirating pyrometer; and

d. means attached to said holder at the downstream end of said refractory tubes for preventing longitudinal movement of said second tubes in the event of failure of the bond cementing said tubes to each other and to said holder.

4,038,106
FOUR-LAYER TRAPATT DIODE AND METHOD FOR MAKING SAME

Hirohisa Kawamoto, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,365
Int. Cl.[2] H01L 21/26
U.S. Cl. 148—1.5 10 Claims



1. A method for making a diode for optimum operation in the TRAPATT mode, the diode having several layers of a semiconductor including two innermost layers, the two innermost layers forming a PN junction close to a surface of the diode, the diode having an impurity profile about the PN junction in the two innermost layers, the profile exhibiting the same slope on each side of the PN junction, said method comprising the steps of:

a. implanting impurities of a first conductivity type into a lightly doped original layer of a second conductivity type, the original layer being located on a heavily doped semiconductor wafer having impurities of the second conductivity type, up to a density of the order of 5×10^{16} atoms-cm^{-3};

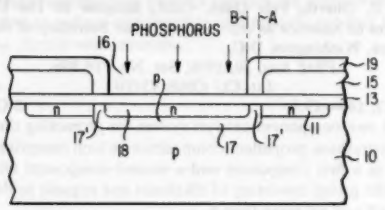
b. depositing on the original layer a means for preventing out-diffusion of the implanted impurities;
c. diffusing the implanted impurities into the original layer;
d. simultaneously diffusing the impurities in the heavily doped wafer into the original layer during the diffusion of the implanted impurities whereby the PN junction is formed in the original layer;
e. thereafter removing said means for preventing out-diffusion from said original layer; and
f. diffusing impurities of the first conductivity type into the original layer.

4,038,107

METHOD FOR MAKING TRANSISTOR STRUCTURES

George Marr, Cupertino, Calif., and George Elwood Smith, Murray Hill, N.J., assignors to Burroughs Corporation, Detroit, Mich. and Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1975, Ser. No. 637,177
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 6 Claims



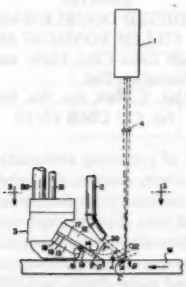
1. In a method for making at least one semiconductor device having a first impurity region removed a short lateral distance from a second impurity region, the improvement CHARACTERIZED BY forming over the semiconductor substrate a mask having an opening having a first vertical edge; controllably decreasing the opening in the mask thereby to define a second vertical edge laterally removed a controlled distance from the location of the first edge; using the first edge to define the location of the first impurity region in the substrate; and using the second edge to define the location of the second impurity region.

4,038,108

METHOD AND APPARATUS FOR MAKING AN INSTANTANEOUS THERMOCHEMICAL START

Stephen August Engel, Shenorock, and Ronald Elmer Fuhrhop, Suffern, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,833
Int. Cl.[2] B23K *7/06*
U.S. Cl. 148—9.5 25 Claims



1. A method for making an instantaneous thermochemical start on the surface of a metal workpiece to be scarfed comprising the steps of:
a. contacting a preselected spot on said surface where the scarfing reaction is to begin with a laser beam to bring such spot to its ignition temperature;
b. impinging a high intensity jet of oxygen gas on said surface at said spot, thereby causing an instantaneous scarfing reaction to begin and a molten puddle to form at said spot; and
c. continuing the impingement of a high intensity jet of oxygen on said puddle until said puddle has spread to a preselected width.

4,038,109

THREE PHASE HEAT TREATMENT OF STEEL SHEET

Bernard Pflieger, Chamalieres, and Andre' Reiniche, Ceyrat, both of France, assignors to Compagnie Generale des Etablissements Michelin, France

Filed May 20, 1976, Ser. No. 688,112
Claims priority, application France, May 21, 1975, 75.15899
Int. Cl.[2] C21D *7/14, 1/78;* C23C *11/12, 11/18*
U.S. Cl. 148—12 F 6 Claims

1. A process for manufacturing a medium-hard to hard thin steel sheet having an increased fatigue strength in which a soft steel sheet having a carbon weight content of less than about 0.25% is cold rolled to a thickness of between about 10 μm and about 500 μm whereupon the resulting soft thin steel sheet is subjected to a carburizing or carbonitriding treatment until a medium-hard to hard thin steel sheet having a carbon weight content of between about 0.5% and about 1.2% is obtained, characterized by the fact that the carburizing or carbo-nitriding treatment is followed by a three-part heat treatment, the first part of which heat treatment consists of a first austenizing operation at an elevated temperature for a sufficient period of time to obtain a very homogeneous austenitic steel, followed by a two-step cooling; the second part of which heat treatment consists of a second austenizing operation of very short duration at a temperature very slightly above the transformation point from the α phase to the γ phase, followed by a two-step cooling identical to that following the first part of the three-part heat treatment, this two-step cooling comprising a first rapid cooling step which terminates in the vicinity of the temperature separating the pearlitic zone from the bainitic zone and a second slow cooling step from the above temperature down to ambient temperature, the rates of cooling being selected in such a manner as to pass around the pearlitic nose in the T T T (temperature, time, texture) diagram corresponding to the chemical composition of the medium-hard to hard thin steel sheet and so as to obtain a martensitic structure free of pearlite and bainite, the two austenizing operations and each of the first cooling steps being carried out in an oxygen-free medium; and the third part of which heat treatment consists of a rapid reheating operation to a temperature above about 300° C. in an oxygen-free medium, followed by a final cooling in ambient air.

4,038,110

PLANARIZATION OF INTEGRATED CIRCUIT SURFACES THROUGH SELECTIVE PHOTORESIST MASKING

Bai-Cwo Feng, Wappingers Falls, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 480,086, June 17, 1974, Pat. No. 3,976,524.
This application June 14, 1976, Ser. No. 696,102
Int. Cl.[2] H01L *21/308*
U.S. Cl. 148—187 3 Claims

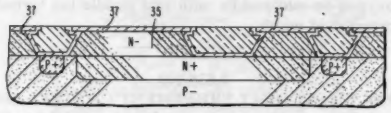
1. In the method of fabrication of planar semiconductor integrated circuits by the selective introduction of impurities into said integrated circuit, the steps of

forming a first layer of electrically insulative material over a planar surface of an integrated circuit member,

forming a pattern of apertures through said first layer to expose the underlying surface,

etching through said apertures with an etchant which preferentially etches said surface for a time sufficient so that said first layer is undercut adjacent said apertures,

depositing a second layer of electrically insulative material under the undercut portions of said first layer, said first insulative material more etchable than said second insulative material in selected etchants,



removing selected portions of said first insulative layer from said surface adjacent said undercut portions with an etchant which preferably etches said first layer, said second layer under the undercut portions of the first layer protecting said surface in said undercut portions during the etching, and

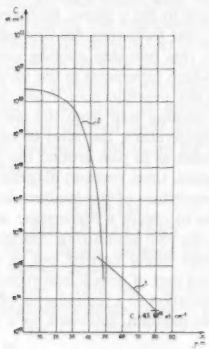
introducing conductivity-determining impurities into said surface underlying said removed selected portions, whereby said second layer remaining in said adjacent undercut portions acts as a masking to laterally define the surface areas into which said impurities are introduced.

4,038,111

METHOD FOR DIFFUSION OF ALUMINIUM

Guy Henri Dumas, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France

Filed July 14, 1975, Ser. No. 595,751
Claims priority, application France, Aug. 1, 1974, 74.26821
Int. Cl.[2] H01L *21/225*
U.S. Cl. 148—188 **9 Claims**



1. A method of diffusing aluminium onto a semiconductor substrate comprising the steps of painting onto a semiconductor substrate a diffusable aluminium source comprising an organic aluminium compound:

$$Al\ R_3$$

wherein R_3 is a C_1 - C_8 alkoxy group dissolved in a liquid composed of an alkoxyalkanol:

$$R' - R''OH$$

wherein the alkoxy group R′ has from 1 to 5 carbon atoms and the alkylene group R″ has 1 to 5 carbon atoms;
and thereafter heating the painted substrate diffusing the aluminium metal into the substrate.

4,038,112

WELL-FRACTURING EXPLOSIVE COMPOSITION

Leo K. Asaoka, Port Tobacco, Md, assignor to Talley-Frac Corporation, Mesa, Ariz.

Filed May 12, 1975, Ser. No. 576,644
Int. Cl.[2] C06B *45/00, 33/08, 25/36*
U.S. Cl. 149—2 **6 Claims**

1. In a liquid explosive composition for geological fracturing having a nitroparaffin or nitrate base, the improvement comprising between 5 and 20 weight percent of a ballistic modifier in the form of finely divided inert non-reactive solids, the particles of which are substantially homogeneous, having a sonic velocity substantially different from that of the remainder of the composition and having a particle size less than about 10 microns.

4,038,113

CATALYST SYSTEM FOR POLYURETHANE PROPELLANTS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,306
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **5 Claims**

1. A two-component catalyst system for promoting the cure of polyurethane propellant compositions which comprises zinc oxide as a first component and a second component selected from the group consisting of diketones and organic acids having a pKa of no more than **6.**

4,038,114

CATALYST SYSTEM FOR POLYURETHANE PROPELLANT COMPOSITIONS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,305
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **4 Claims**

1. A catalyst system for promoting the isocyanate-hydroxy curing reaction of polyurethane based propellant compositions which comprises a mixture of (a) ferric acetylacetonate as a catalyst proper; (b) a suppressor component for suppressing the catalytic activity of said catalyst proper; and (c) a scavenger component composed of zinc oxide for increasing the rate of consumption of the said suppressor component.

4,038,115

COMPOSITE MODIFIED DOUBLE-BASE PROPELLANT WITH FILLER BONDING AGENT

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 7, 1969, Ser. No. 868,666
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.8 **12 Claims**

7. In the process of preparing composite modified double-base propellant by slurry casting, the improvement whereby dewetting of filler particles from the binder under conditions of stress is reduced said improvement comprising admixing with the uncured propellant ingredients at least one filler selected from the group consisting of inorganic oxidizer salts, organic oxidizers and metal fluids, said filler having a cross-linked, binder-insoluble coating having reactive surface-NCO groups, and curing the resulting propellant.

4,038,116

METHOD FOR DEGRADING AROMATIC EXPLOSIVE SOLUTIONS

Catherine C. Andrews, Bedford; Robert E. Klausmeier, Bloomington, and Jerald L. Osmon, Bloomfield, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1976, Ser. No. 704,147
Int. Cl.[2] C06B *25/04*
U.S. Cl. 149—105 5 Claims

1. A method of treating an aqueous solution of aromatic explosives to make said explosives inert comprising,

adding to said aqueous solution of aromatic explosives a small amount of an additive selected from the group consisting of acetone and hydrogen peroxide, which said additive when subjected to ultraviolet light produces a free radical which will strip off hydrogen from said aromatic explosive,

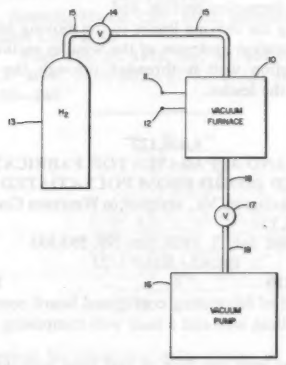
then subjecting said selected additive to ultraviolet light for a sufficient period of time for said selected additive to strip off hydrogen from said aromatic explosives and produce an unstable intermediate product and then for said ultraviolet light to reduce said unstable intermediate product to carbon dioxide and ammonia.

4,038,117

PROCESS FOR GAS POLISHING SAPPHIRE AND THE LIKE

Lowell A. Noble, Monte Sereno; Leonard N. Grossman, Aptos, and Mickey O. Marlowe, Livermore, all of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed Sept. 4, 1975, Ser. No. 610,156
Int. Cl.[2] C09K *13/00*
U.S. Cl. 156—2 6 Claims



1. The process of surface-polishing bodies of sapphire and the like comprising the steps of heating said body to a temperature of about 1900° C and exposing at least one surface of said body to substantially static hydrogen gas while maintaining said temperature of about 1900° C for a time sufficient that no imperfections in said at least one surface can be detected when subsequently examined by a scanning electron microscope at magnifications of at least 1000×.

4,038,118

THREE DIMENSIONAL COMPOSITE STRUCTURE AND METHOD FOR INCORPORATING FITTINGS

Varnell L. James, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 479,397, June 14, 1974, Pat. No. 3,978,256.
This application Mar. 4, 1976, Ser. No. 663,876
Int. Cl.[2] B31C *13/00*
U.S. Cl. 156—143 7 Claims

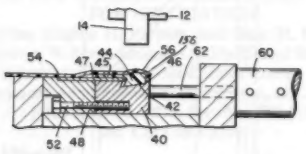
1. A method of preparing an open-ended three-dimensional monocoque structure, the steps comprising: forming reinforced plastic annular rings having a core of a series of spaced apart tubular metal inserts and contiguous light weight reinforcing material filling a remainder of the core, wrapping the annular rings with a continuous wind of composite tape, forming a reinforced plastic annular shell, placing the annular rings over the shell with reinforcing filler between, laying up an outside layer of reinforced plastic to form an assembly, wrapping the assembly in the longitudinal direction with continuous filament composite tape.

4,038,119

BEAD FORMING APPARATUS AND METHOD

Everette M. Lambert, 3380 Edward Ave., Santa Clara, Calif. 95050

Filed Dec. 3, 1975, Ser. No. 637,260
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—163 7 Claims



1. A method for fabricating uniform plastic bead along the margin of a sheet of like plastic material to form a swimming pool liner or like article supportable by said bead, said method comprising the steps of:

inserting an elongate strip of plastic bead material into a cavity defined by an elongate die generally conforming to the shape of said bead material;

overlaying said bead material with a margin of a like plastic sheet material to overlap said die cavity with a margin of excess sheet material;

laterally compressing said bead material in said die to create a convex curvature of bead material in abutting relationship to said sheet material;

compressing said sheet material against said bead material transverse of said die compressions; and

fusing said sheet material into said bead material to establish a heat sealed bead of homogeneous plastic material for minimizing the formation of a tear line along the junction of said bead material and said sheet material.

5. An apparatus for forming a uniform plastic bead along a

margin of a like plastic sheet material, said apparatus comprising:

a working bed for supporting said sheet material;

means for forming a heat seal, said seal forming means comprising an elongate member and means for moving said elongate member transversely relative to said working bed;

an elongate die defining an upwardly opening cavity for gripping said bead of said plastic material below and overlying a plastic sheet disposed upon said working bed, said die comprising a fixed member, and opposing laterally movable member, and means for guiding said movable member for laterally expanding and contracting said head gripping cavity, said fixed member having a lip depressed relative to said opposing movable member, and said movable member having a laterally inwardly extending shoulder for engaging a portion of said bead material opposing said depressed lip;

said die being compressible upon said bead material to induce an upward curvature; and

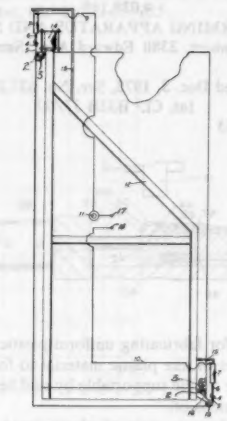
said elongate member being transversely movable along said die for compressing said overlying sheet material against said bead material and for fusing said bead material and said sheet material into a fused bead which conforms to the shape of said die cavity.

4,038,120

ELECTRIC HEAT BONDING TAPE METHOD FOR CONSTRUCTION PANELS

Carl D. Russell, 1502 S. Boulder St. No. 24-D, Tulsa, Okla. 74119

Filed Nov. 9, 1972, Ser. No. 305,147
Int. Cl.[2] E04B *2/00*
U.S. Cl. 156—71 **4 Claims**



1. The method of bonding a panel along at least one grooved predetermined edge thereof to existing structure comprising the steps of:

locating an elongated hot melt glue tape including an elongated electrical heater means in said groove along said edge of the panel to be bonded;

locating the panel with said edge in said bonding position relative to said structure;

energizing the heater means to liquefy the glue;

discontinuing the energization to permit the glue to cool and bond said edge to the structure; and,

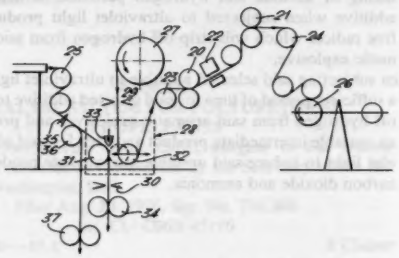
maintaining said elongated heater means under tension to take up expansion during said energization and while the glue cools.

4,038,121

PRODUCTION OF THERMOPLASTIC FILMS

Nigel Colin Benson, and John Dorab Mehta, both of Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 14, 1975, Ser. No. 622,160
Claims priority, application United Kingdom, Oct. 24, 1974, 46012/74; Jan. 10, 1975, 1112/75
Int. Cl.[2] B31F *5/00*; B65H *69/06*
U.S. Cl. 156—157 **5 Claims**



1. A method of threading a thermoplastic film, issuing from a web-formation section of a production line, through a wind-up section when the production line is re-started after a stoppage or after the wind-up section has become unthreaded due to a malfunction in the web formation section, said method comprising:

a. running the formation section and feeding the moving production web to waste while simultaneously threading a leader through the wind-up section while the latter is stopped,

b. starting the wind-up section so as to begin winding up the leader and matching the speed of the wind-up section to that of the formation section, and

c. then joining the moving leader to the moving production web at a location upstream of the windup section so that the production web is threaded through the wind-up section by the leader.

4,038,122

METHOD AND APPARATUS FOR FABRICATING CORRUGATED BOARD FROM POLY-COATED PAPER

John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,833
Int. Cl.[2] B31F *1/22*
U.S. Cl. 156—210 **17 Claims**

14. A method of fabricating corrugated board comprising a corrguated medium web and a liner web comprising the steps of:

A. Coating at least one face of said liner web with a thin laminae of polymer plastic material.

B. Contacting said coated face of said liner web against the surface of a rotating heater drum for a time period sufficient to soften said plastic material to a tacky consistency.

C. Peeling said liner web from the surface of said heater drum at a first nip of a treated fusion roll with said heater drum;

D. Fusing the coated surface of said liner web with the crests of corrugation flutes formed in said medium web in a

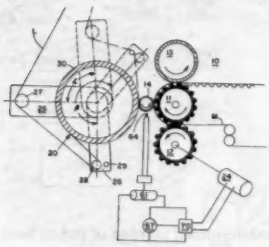
second nip of said fusion roll with a rotating corrugating roll; and

E. Cooling the fused combination of said liner web and said medium web in a nip between a chilled pressure roll and said corrugating roll.

16. In an apparatus for bonding a liner web to corrugation crests of a medium web, said liner web comprising a lamination of polymer plastic film to at least one surface of a paperboard web, said apparatus comprising:

A. Rotational drive means for rotating a cooperating pair of medium web corrugating cylinders;

B. Heating means for transmitting heat to the plastic film laminae of said liner web;



C. Rotatable heated fusion roll means positioned in nip relationship with one of said corrugating cylinders for guiding said liner web into a fusion nip with the corrugation crests of said medium web;

D. Temperature sensing means positioned between said heating means and said fusion nip for sensing the temperature of said plastic film laminae and emitting a temperature signal proportional thereto; and

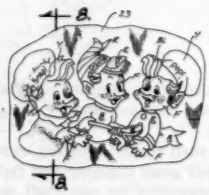
E. Speed control means responsive to said temperature signal for regulating the rotational speed of said drive means to maintain the temperature of said plastic film laminae within a desired temperature range.

4,038,123

METHOD FOR PRINTING A COLOR DESIGN ON A RELEASE PAPER FOR HEAT TRANSFER TO A FABRIC MATERIAL

George L. Sammis, Mason City, Iowa, assignor to Mach III, Inc., Mason City, Iowa

Filed Feb. 27, 1976, Ser. No. 661,811
Int. Cl.[2] B44C *1/16;* B32B *27/12, 31/20;* B41M *3/12*
U.S. Cl. 156—240 4 Claims



1. A method for printing a color design on a heat release paper for heat transfer from the paper to a fabric material comprising the steps of:

a. offset printing a design in color on the release paper,

b. silk screening on said offset printed design a dark colored plastisol material to outline portions of the design to intensify the color appearance of such portions,

c. heat drying the design a first time at a temperature of about 350° Fahrenheit for a time period of not more than about ten seconds,

d. applying to the design an adhesive film having design and fabric material adhering characteristics,

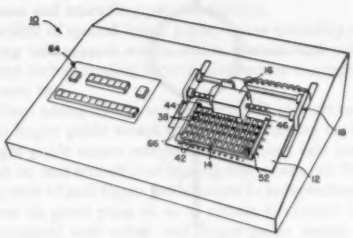
e. heat drying the design a second time at a temperature of about 350° Fahrenheit for a time period of not more than about 10 seconds.

4,038,124

MICROFICHE DELETER METHOD

Augustus W. Griswold, 2 Pine Tree Trail, Rush, N.Y. 14543, and Boris W. Haritonoff, Pole Bridge Road, Geneseo, N.Y. 14454

Division of Ser. No. 327,499, Jan. 29, 1973, Pat. No. 3,927,586.
This application Oct. 2, 1975, Ser. No. 618,884
Int. Cl.[2] B31B *1/25;* B32B *31/18*
U.S. Cl. 156—248 10 Claims



1. A method for preparing an updated microfiche, wherein said microfiche is of the type including a base and a plurality of microfilm frames removably mounted on the base, comprising:

a. mounting said microfiche on a deck;

b. providing a separate light under each frame and energizing only those lights under frames to be deleted;

c. positioning a movable knife carriage, including a knife blade, over said microfiche;

d. positioning said carriage and knife blade over a frame to be deleted and cutting, with said knife blade, said frame to be deleted from all adjacent frames connected thereto; and

e. removing said cut frame to be deleted from said base.

4,038,125

METHOD FOR MOUNTING LASER FUSION TARGETS FOR IRRADIATION

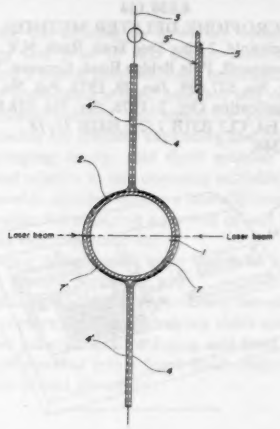
R. Jay Fries; Eugene H. Farnum, and Gene H. McCall, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 18, 1975, Ser. No. 588,119
Int. Cl.[2] C09J *5/06*
U.S. Cl. 156—280 6 Claims

5. A method for forming a ball-and-disk laser fusion target assembly suitable for single-beam laser irradiation which comprises (a) mounting a thin cellulose acetate film across the opening of a target holder, (b) placing a thin polystyrene film in intimate contact with said cellulose acetate film, (c) placing a target microsphere at a desired location on said polystyrene film, (d) heating the assembly to a temperature at which said polystyrene film becomes tacky to bond said target microsphere to said polystyrene layer, (e) cooling the assembly, (f) masking said polystyrene film beyond a desired radius from said target microsphere, and (g) depositing polyethylene to a desired thickness on the unmasked portion of said polystyrene film and on said target microsphere.

6. A method for forming a ball-and-disk laser fusion assembly suitable for double-beam laser irradiation which comprises (a) mounting a first thin cellulose acetate film across the opening of a target holder, (b) placing a target microsphere at a desired location on said first film, (c) placing a second thin planar film of cellulose acetate over said target microsphere and substantially parallel to said first film, (d) exerting downward pressure on said second film sufficient to cause the plane

of said second film to come into intimate contact with the plane of said first film and causing the plane of the resultant joined first and second films to pass substantially through the diameter of said target microsphere, (e) heating the assembly to a temperature below the softening temperature of the cellulose



acetate but sufficient to bond said first and second films together, (f) masking both sides of said bonded film beyond a desired radius from said target microsphere, and (g) depositing polyethylene to a desired thickness on the unmasked portions of both sides of said bonded film.

4,038,126

METHOD FOR FORMING TABLE AND BENCH CONSTRUCTION

Fritz O. Lester, Kalamazoo, Mich., assignor to Liane E. Lester, Kalamazoo, Mich.

Division of Ser. No. 419,675, Nov. 28, 1973, Pat. No. 3,968,755. This application Feb. 20, 1976, Ser. No. 659,640

Int. Cl.[2] B32B *7/12, 3/08, 31/26*

U.S. Cl. 156—290 **3 Claims**

1. A method of forming a table top comprising forming a plurality of table top sectors having depending flanges, coating said sectors with a heat-softening adhesive, assembling said sectors into engagement with each other with flanges of each sector abutting a flange of each adjacent sector, and spot heating said sectors at abutting flanges to cause said sectors to adhere to each other.

4,038,127

APPARATUS FOR CONTROLLING THE ANGULAR ORIENTATION OF THE END OF A ROLLED WEB

Richard H. D. Bullock, Jr., Media; George Gallatig, West Chester, both of Pa., and Kurtz A. Franklin, Burlington, N.J., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 8, 1976, Ser. No. 730,711

Int. Cl.[2] B26D *5/00*

U.S. Cl. 156—353 **48 Claims**

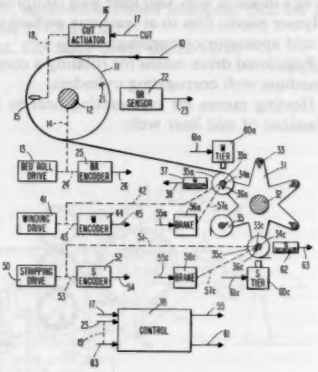
1. In a system for cutting a desired length of a web being wound in a roll, an apparatus for orienting the free end of the roll at a predetermined angle, said orienting occurring in synchronism with the cutting, comprising:

a. first means for generating a signal representative of the cutting of the web;

b. second means for generating a series of pulses, each pulse representing an incremental length of the web being wound on the roll;

c. third means for generating a number representing a predetermined number of pulses generated by the second means; and

d. circuit means including a counter responsive to the first means signal, the second means pulses and to said predetermined number for generating a signal indicating that



said predetermined number of pulses have been generated by the second means since the occurrence of the signal generated by the first means, said circuit means signal indicating that the free end of the roll is at the predetermined angle.

4,038,128

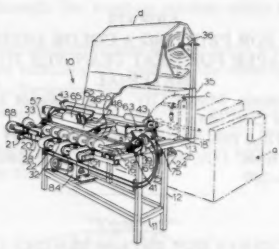
INSULATION BLANKET SHEARING AND APPLYING MACHINE FOR DUCTWORK AND THE LIKE

Thomas L. Mueller, St. Louis, Mo., assignor to Engel Industries, Inc., St. Louis, Mo.

Filed Dec. 17, 1976, Ser. No. 751,392

Int. Cl.[2] B32B *31/04*

U.S. Cl. 156—355 **9 Claims**



2. A flying cut-off mechanism comprising

a pair of racks arranged linearly along opposite sides of a flow path,

a transverse shaft extending thereover and having secured at its ends spur gears engaging said racks,

a carriage supported by said shaft and bearing a cutting block,

a transverse shear blade extending across said path and having at its ends operating arms mounted for rotation on said carriage,

sectors secured to said arms and engaging said racks upstream of said spur gears, and

actuator means to drive the carriage downstream and retract it upstream,

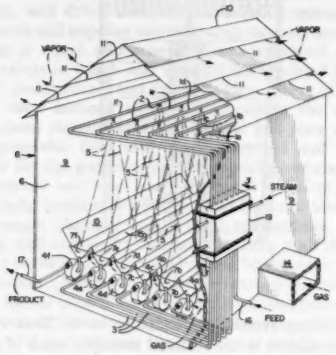
whereby downstream movement of the carriage will so rotate the sectors as to cause the shear blade to rotate toward and engage the cutting block, thereby stopping

further downstream movement and utilizing the inertia of the carriage for shearing.

4,038,129
METHOD AND APPARATUS FOR CONCENTRATING LIQUIDS

Rolf W. Wreszinski, Caixa Postal, 9549, Sao Paulo, Brazil

Filed July 9, 1975, Ser. No. 594,212
Int. Cl.[2] B01D *1/16*; F26B *3/12*
U.S. Cl. 159—4 CC **13 Claims**

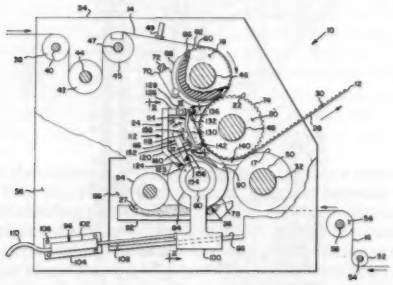


1. A method of continuously concentrating a liquid in a plurality of successive stages, comprising in each stage pumping a concentration of the liquid to a related one of a plurality of spaced overhead nozzle sets, without partitioning between said sets spraying said liquid from each nozzle of said set as a finely dispersed spray separate from the spray from any nozzle of any other set to an underlying one of a like plurality of liquid-separate troughs, and heating said liquid in each stage by heat transfer from a heating medium common to all stages for effecting with said spraying partial evaporation of said liquid during said fall.

4,038,130
CORRUGATING MACHINE HAVING SELF-ADJUSTING WEB GUIDES

James Lynwood Cosby, Parkville, and Gordon Lawrence Morgret, Baltimore, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 16, 1975, Ser. No. 596,407
Int. Cl.[2] B31F *1/00*
U.S. Cl. 156—473 **29 Claims**



1. An improved corrugating machine for forming a single-face corrugated paper web from a pair of webs passing therethrough of the type comprising:

first corrugating roll means;

second corrugating roll means in meshing engagement with said first corrugating roll means and carrying a web of corrugated paperboard material around a portion of an outer periphery thereof;

guide means urging said corrugated web against said outer periphery of said second corrugating roll means;

adhesive roll means in contact with said corrugated web for applying adhesive to the tips of flutes on said corrugated web extending around said second corrugating roll means; and

pressure roll means carrying a facing web on an outer periphery thereof in contact with said adhesive covered tips of said corrugated web for forming said single face corrugated web,

wherein the improvement comprises an automatically self-adjusting, floating guide means including

a support means spaced from said second corrugating roll means and extending parallel thereto;

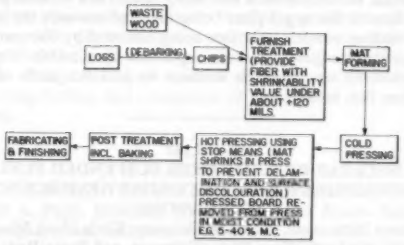
a plurality of spaced finger guide means pivotably mounted along said support means and in contact with said corrugated web extending around said second corrugating roll means; and

a resilient means interposed between said support means and said finger guide means continuously urging each of said finger guide means independently against said corrugated web on said second corrugating roll means and for allowing each of said finger guide means to independently pivot about its pivot point so as to remain in contact with said corrugated web when said finger guide means contacts irregularities in said corrugated web and said second corrugating roll means.

4,038,131
SHORT CYCLE PRESSED FIBERBOARD MANUFACTURING PROCESS

Stanley H. Baldwin, Oakville, and Arnold E. Willoughby, Mississauga, both of Canada, assignors to Abitibi Paper Company Ltd., Canada

Filed Oct. 6, 1975, Ser. No. 620,182
Int. Cl.[2] D21J *1/04*
U.S. Cl. 162—103 **36 Claims**


WASTE WOOD
LOGS
(DEBARKING)
CHIPS
FURNISH TREATMENT (PROVIDE FIBER WITH SHRINKABILITY VALUE UNDER ABOUT +120 MILS
MAT FORMING
FABRICATING & FINISHING
POST TREATMENT INCL. BAKING
HOT PRESSING USING STOP MEANS (MAT SHRINKS IN PRESS TO PREVENT DELAMINATION AND SURFACE DISCOLOURATION) PRESSED BOARD REMOVED FROM PRESS IN MOIST CONDITION E.G. 5-40% M.C.
COLD PRESSING

1. The process of producing pressed fiberboard including the steps of providing an aqueous slurry of wood fibre, dewatering said slurry to form a wet mat, hot pressing said mat between a pair of heated upper and lower press members to remove a substantial portion of the water in said mat and to cause binding of the fibres to form a board, and subsequently moving the press members apart and removing the board therefrom, said press having control means therein to limit the degree of advance of the press members toward one another, and wherein said fiber has a Shrinkability Value not higher than about +120 mils such that during said hot pressing the mat of fibres shrinks in thickness while at the same time said press members are prevented from moving toward one another by said control means, with said shrinkage being sufficient to permit gradual dissipation of steam pressures generated within the board being formed thus permitting the press members to be moved apart and the board removed while said board still contains a

substantial quantity of moisture therein without incurring delamination of the board by virtue of unrelieved steam pressures therein.

4,038,132

NUCLEAR REACTORS

Kenneth George Pearson, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 18, 1975, Ser. No. 605,243

Claims priority, application United Kingdom, Sept. 17, 1974, 40472/74

Int. Cl.[2] G21C *15/18*

U.S. Cl. 176—38 **4 Claims**

1. A nuclear fuel element comprising a cluster of nuclear fuel rods supported axes parallel in spaced apart relationship by transverse grids so as to define interspaces for the axial flow of coolant and having at least one of the interspaces occupied by an axially extending auxiliary coolant conduit with lateral holes through which auxiliary coolant is sprayed into the cluster and including deflection means extending from a transverse grid and located in a position in front of the holes for deflecting coolant spray onto parts of the fuel rods inaccessible to auxiliary coolant, and the deflecting means are constituted by a target plate secured to a grid and with a face of the plate positioned in the trajectory of one or more jets of auxiliary coolant from the auxiliary coolant conduit, and the target plate depends vertically from a grid between two rows of nuclear fuel rods, the rods in each row being spaced at a uniform pitch, said face of the target plate being directed towards the auxiliary coolant conduit, said face being bounded by two parallel longitudinal edges which are separated by a width of plate substantially equivalent in distance to half the pitch of the nuclear fuel rods.

4,038,133

NUCLEAR REACTOR WITH SUSPENDED FUEL ASSEMBLIES HAVING SECONDARY EMERGENCY SUSPENSIONS

Dietmar Bittermann, Erlangen, Germany; Kevin Hunt, Macclesfield, England; Klaus Klein, Erlangen, and Peter Rau, Mittelehrenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

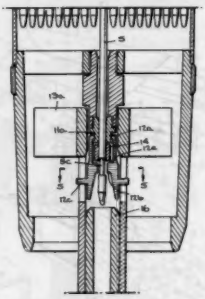
Continuation-in-part of Ser. No. 462,434, April 19, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,112

Claims priority, application Germany, Apr. 19, 1973, 2320146

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—38 **7 Claims**

1. A nuclear reactor having a core comprising a plurality of laterally adjacent fuel assemblies, each assembly comprising a vertically elongated casing containing fuel rods and the casing having an upper end and extending downwardly therefrom and having an open lower end extending below said fuel rods, each casing having a vertical tubular suspension rod having an upper end with a supported connection above said casing and a lower end with a connection to the casing's said upper end so that the casing is suspended thereby, at least one of said connections being releasable, each assembly having a rod-like element having an upper end fixed above said casing, said rod-like element suspending from its said upper end downwardly and sliding by through said tubular suspension rod and the casing and having a lower end below the fuel rods and in the casing's said lower end, each fuel assembly independently of its said rod-like element being individually removable downwardly from the core by release of the releasable connection of its said suspension rod, failure of said suspension rod or its said connections in the case of any one of said assemblies causing an accidental release of such assembly so that it can fall from the core while its said rod-like element and any adjacent fuel



assembly casing remain suspended so as to form vertically fixed parts relative to the released assembly, each of said casings having latch means for releasably normally latching its casing to one of said relatively fixed parts so that an accidentally released assembly cannot fall substantially relative to that one of the relatively fixed parts, said latch means having a latch release means on the inside of said lower end of the casing for actuation by tool means removably inserted upwardly via said lower end of any of said casings.

4,038,134

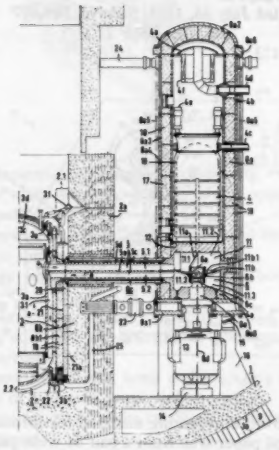
PRESSURIZED WATER-COOLED REACTOR SYSTEM

Heinrich Dorner, Erlangen; Elmar Harand, Hochstadt, and Walter Kleiter, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 393,287, Aug. 31, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,914

Int. Cl.[2] G21C *19/28*

U.S. Cl. 176—65 **2 Claims**



1. A pressurized-water nuclear reactor installation comprising components including a vertical reactor pressure vessel, at

least one vertical steam generator positioned adjacent to said vessel, and a coolant line interconnecting and extending substantially straight between said vessel and said generator, said line comprising coolant return and forwarding pipe portions forming with said generator a pressurized-water coolant circuit for said vessel, said generator containing a horizontal heat exchanger tube plate and forming a space below said plate and said space forming a part of said circuit, said space containing a coolant rotary pump impeller, the drive shaft of which is arranged vertically, all of said components being separately encapsulated by rupture-proof safety housings, a rotary drive motor for said impeller positioned on the outside of all of said housings, said drive shaft of said impeller connecting said motor with said impeller and extending through the one of said housings in which said generator is encapsulated, the one of said housings in which said vessel is encapsulated forming an annular space around said vessel and the others of said housings in each instance tightly encapsulating the component encapsulated thereby, said space below said plate comprising steam generator inlet and outlet chambers and a pressure chamber for the pump, a first substantially vertical, partition wall between said inlet and said outlet chamber, a second substantially horizontal partition wall between said inlet and said pressure chamber and a third substantially horizontal partition wall containing the pump housing with the impeller rotatably positioned within said housing between said outlet and said pressure chamber, said pump housing forming a fluid passage for the coolant from said outlet to said pressure chamber, a coolant forwarding pipe portion communicating at its one end with said pressure chamber and at its other end with a coolant inlet channel of said vessel, a coolant return pipe portion communicating at its one end with said inlet chamber and at its other end with a coolant outlet channel of said vessel, and an U-shaped tube type steam generator with its tube bundle's inlet end communicating with said inlet chamber and its tube bundle's outlet end communicating with said outlet chamber.

4,038,135

PLATE TYPE NUCLEAR FUEL ELEMENT AND A METHOD OF FABRICATION OF SAID ELEMENT

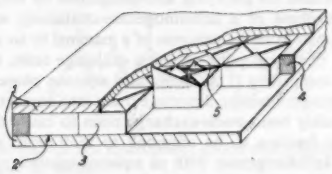
Rene Bergougnoux, Aix-en-Provence, and Jacques Delafosse, Gif-sur-Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 484,743, July 1, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,730

Claims priority, application France, July 6, 1973, 73.24992; Apr. 3, 1974, 74.11821

Int. Cl.[2] G21C *3/02*

U.S. Cl. 176—68 **14 Claims**



1. A plate-type nuclear fuel element comprising a core having a base of ceramic fuel material enclosed between two metallic cladding plates, wherein the fuel core is constituted by the juxtaposed array of a plurality of thin wafers of a ceramic fuel material, said wafers each having a geometric shape such that their planar juxtaposed assembly serves to form said plate-type nuclear fuel element which does not have any vacant spaces, at least a number of said wafers being provided with an individual metallic protection constituted by covering at least the lateral perimeters of said wafers with a thin metallic covering prior to assembly of said wafers to form said plate-type nuclear fuel element, said thin metallic covering having a contributory function in the assembly of cladding the wafers and dividing said plate-type nuclear fuel element into compartments.

4,038,136

SUPPORT STRUCTURE FOR THE LATERAL NEUTRON SHIELD SYSTEM OF A FAST REACTOR CORE

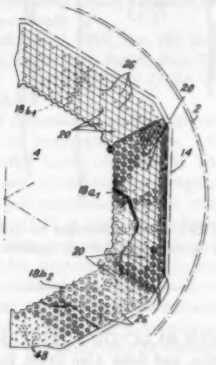
Bernard Gallet, Bruyeres-le-Chatel, and Robert Venot, Fontenay-aux-Roses, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 9, 1975, Ser. No. 584,762

Claims priority, application France, June 11, 1974, 74.20214

Int. Cl.[2] G21C *13/00*

U.S. Cl. 176—87 **5 Claims**



1. A support structure for the lateral neutron shield system of a fast reactor core, said core being a vertical axis of symmetry and including a core support structure and a lateral neutron shield wherein said structure is a horizontal ring having an internal contour coinciding exactly with an external contour of the reactor core, a bottom face of said ring being supported by a periphery of said core support structure, said ring comprising a plurality of horizontal layers of metallic plates, clamping members maintaining said layers in relative positional relation, said metallic plates of one layer being angularly displaced around said axis of symmetry and overlappedly engaging said plates of adjacent layers, vertical through-holes in said ring receiving bottom end-connectors of elements of said neutron shield.

4,038,137

LOCKING MEANS FOR FUEL BUNDLES

Ralph A. Pugh, Richland, Wash., assignor to Exxon Nuclear Company, Inc., Bellevue, Wash.

Continuation of Ser. No. 400,734, Sept. 26, 1973, abandoned, which is a continuation of Ser. No. 273,161, July 19, 1972, abandoned. This application Nov. 3, 1975, Ser. No. 628,545

Int. Cl.[2] G21C *3/32*

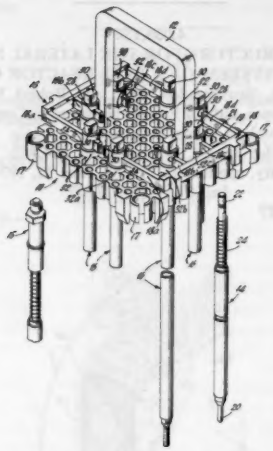
U.S. Cl. 176—78 **6 Claims**

1. In a nuclear power reactor fuel bundle having tie rods for securing a pair for fuel rod mounting end plates in assembled position against the force exerted by compressed springs operably associated with said fuel rods and urging at least one of said end plates away from the other of said end plates, the improvement which comprises:

a. an elongated slot near an end of each of said tie rods, said slot having an upper end spaced from said end of said tie rod, said slot extending at least partially beyond said one of said end plates when said end plates are in assembled position; and

b. a fork-shaped member having a plurality of parallel tines which maintain said end plates in assembled position, each of said tines extending through a corresponding one of

said slots in parallel relation, said compressed springs urging said end plate into abutting engagement with said



tines of said fork-shaped member so that said tines of said fork-shaped member are forced against said upper end of said slots.

4,038,138

NUCLEAR REACTOR FUEL ELEMENTS

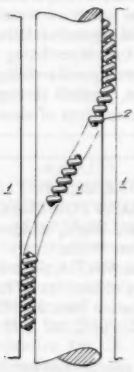
David Lees Linning, and John Alan Dodd, both of Warrington, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 20, 1975, Ser. No. 551,078

Claims priority, application United Kingdom, Mar. 7, 1974, 10243/74

Int. Cl.[2] G21C *3/12*

U.S. Cl. 176—81 **2 Claims**



1. In a liquid metal cooled fast reactor, a sub-assembly comprising a bundle of spaced fuel elements surrounded by a wrapper, said fuel elements each comprising an elongate cylindrical sheath at least a portion of which is of constant diameter cross section and containing nuclear fuel and having at least one spacing member for spacing the fuel element from neighboring elements in a bundle, said spacing member comprising a wire member helically wrapped around the sheath in the form of a helix over said portion of said fuel element sheath of constant diameter, the improvement wherein all of said wire members are identical and each of said wire members comprises a wire of constant diameter wound about its longitudinal axis in the manner of an open coil spring and wrapped around said fuel element as said helix such that said wire member contacts the fuel element at a series of regularly spaced intermittent points such that, in use, coolant can flow between said wire member and the fuel element and between the points of contact.

4,038,139

CELL CULTURE MEDIUM

John R. Birch, High Wycombe, England, assignor to G. D. Searle & Co., Limited, High Wycombe, England

Filed July 16, 1976, Ser. No. 705,862

Int. Cl.[2] C12B *3/00*

U.S. Cl. 195—1.8 **5 Claims**

1. A culture medium for lymphoblast cells comprising an aqueous nutrient medium containing 0.5 - 20% swine serum and about 0.1% of a surfactant which inhibits the precipitation of protein.

4,038,140

PROCESS FOR BINDING BIOLOGICALLY ACTIVE PROTEINS

Dieter Jaworek, Weilheim; Joseph Maier, Pocking, and Michael Nelbock-Hochstetter, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed May 30, 1975, Ser. No. 582,495

Claims priority, application Germany, June 4, 1974, 2426988

Int. Cl.[2] C12K *1/00*; C07G *7/02*; C08L *5/00*

U.S. Cl. 195—63 **15 Claims**

1. Process for binding a biologically active protein to an insoluble carrier which process comprises reacting at least one such protein in aqueous phase with a carrier comprising an activated polysaccharide with a hydrophilic graft co-polymer grafted thereinto, wherein said polysaccharide is activated by alkylation or acylation monomers, or by radical formation.

12. Process as claimed in claim **1** wherein the biologically active protein is an enzyme.

4,038,141

METHODS FOR EXTRACTING AND PURIFYING KALLIDINOGENASE

Kiyochika Tokuyasu, Higashiyamato; Takeshi Yokobori, Sayama, and Chizuko Nakahara, Hino, all of Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

Division of Ser. No. 638,042, Dec. 5, 1975, Pat. No. 3,994,782. This application Apr. 7, 1976, Ser. No. 674,645

Int. Cl.[2] C07G *7/026*; C12D *13/10*

U.S. Cl. 195—66 R **11 Claims**

1. In a method for purifying kallidinogenase by subjecting the aqueous phase of a kallidinogenase-containing aqueous extract obtained from the pancreas of a mammal to an adsorption-elution treatment using an anion exchange resin, the improvement comprising (1) bringing said aqueous phase of the kallidinogenase-containing aqueous extract into contact with a gel-type weakly basic anion-exchange resin to cause the kallidinogenase fraction to be adsorbed to said resin, and (2) eluting the kallidinogenase with an aqueous solution of a salt consisting of an ammonium salt of a weak acid, thereby to collect the kallidinogenase.

4,038,142

ISOLATION AND CHARACTERIZATION OF PHENOTYPES OF MYCOBACTERIA

Raymond Turcotte, Montreal, and Marc Quevillon, Ville D'Anjou, both of Canada, assignors to Institut Armand Frappier, Ville de Laval, Canada

Filed May 30, 1975, Ser. No. 582,376

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—96 **3 Claims**

1. Process which comprises culturing a mycobacteria under partial anaerobic conditions in culture bottles containing a

liquid medium selected from the group consisting of Sauton's medium, Long's medium, Proskauer and Beck's medium and Middlebrook's medium, said liquid medium partially filling said culture bottles, said culture bottles being tightly closed and incubated on their flat side at 37.5° C during 14 to 21 days, the pH of said culture medium being maintained between 4.5 and 8.5, said culturing being carried out during about 14 to 21 days, thereby obtaining surface bacterial pellicles consisting of a mixture of smooth, filamentous and rough bacterial islets, respectively constituting Phenotypes 1, 2 and 3 of said mycobacteria, separately subculturing each of said Phenotypes 1, 2 and 3 in new supply of said liquid medium and isolating each of said Phenotypes 1, 2 and 3 in pure state.

4,038,143

TEST KIT FOR THE GENETIC DETECTION OF MICROORGANISMS

Elliot Juni, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 410,533, Oct. 29, 1973, Pat. No. 3,390,956. This application Aug. 15, 1975, Ser. No. 605,059

Int. Cl.[2] C12K *1/10*

U.S. Cl. 195—100 **21 Claims**

1. A test kit for detecting the presence of a specific microorganism in a biological sample based on the phenomenon of genetic transformation, which test kit comprises (1) a transformable variant of said specific microorganism which is distinguishable therefrom and (2) an aqueous solution separate from said variant containing a surfactant at a concentration of between about 0.01 and 0.1 percent by weight which is sufficient to lyse substantially all of the microorganism cells present in said biological sample while insufficient to destroy a substantial amount of said variant upon contact therewith when said variant is supported on a medium capable of diffusing aqueous solutions.

4,038,144

METHOD OF INCREASING FERMENTATION YIELDS

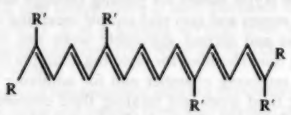
John L. Gainer, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Apr. 19, 1976, Ser. No. 678,113

Int. Cl.[2] C12B *3/12*; C12D *1/00*; C12B *1/00*

U.S. Cl. 195—100 **9 Claims**

9. A fermentation broth which comprises microorganisms, a nutrient medium for fermentation of said microorganism, and an amount of water soluble carotenoid therein effective for increasing the yield of fermentation by said microorganism; wherein said water-soluble carotenoid has the formula:



wherein each R is a hydrophilic group and wherein each R' is hydrogen or methyl.

4,038,145

MALIGNANCY DIAGNOSTIC METHOD

Richard G. Devlin, Mount Vernon, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed July 8, 1974, Ser. No. 486,547

Int. Cl.[2] C12K *9/00*

U.S. Cl. 195—103.5 R **18 Claims**

1. The method for diagnosing lymphoid malignancy in a mammal employing the mixed lymphocyte reaction in tissue culture which comprises securing tissue specimens from at least one pair of tissues selected from the group consisting of lymph node, spleen, and blood of said mammal, individually preparing single cell suspensions of lymphocytes contained in said specimens in an aqueous tissue culture medium in which said lymphocytes can be cultivated, cultivating said lymphocytes of at least one pair of said tissues separately and together as a mixed culture in said medium for a period sufficient for the development of the mixed lymphocyte reaction when lymphocyte reactive cells are present, and determining whether a mixed lymphocyte reaction has occurred.

4,038,146

METHOD OF DETERMINATION OF SERUM TRIGLYCERIDES AND REAGENTS

Urao Nonaka, Tokyo; Hideto Shibata, and Nobuyuki Nakajima, both of Funabashi, all of Japan, assignors to Latron Laboratories, Inc., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 531,120

Claims priority, application Japan, June 7, 1974, 49-63893

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—103.5 R **2 Claims**

1. A method of determining serum triglycerides by hydrolysis according to an enzymatic reaction, wherein a serum is added to a reaction liquid obtained by adding an aqueous solution of a mixture of a tetrazolium compound and phenazine methosulfate to an enzyme-coenzyme reagent comprising lipoprotein lipase (LPL), glycerol dehydrogenase (GDH) obtained from bacillus megatherium and nicotinamide adenine dinucleotide (NAD), thereby effecting an enzymatic hydrolysis of the triglycerides and dehydrogenation of the resulting glycerol in one step with simultaneous reduction of the tetrazolium compound to formazan and determining colorimetrically at a wavelength in the range of 570–600nm the color developed by said reduction.

4,038,147

METHOD FOR DETECTING ENDOTOXINS

Woodrow James Reno, Baltimore, Md., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed June 15, 1976, Ser. No. 696,429

Int. Cl.[2] G01N *31/00, 33/16*

U.S. Cl. 195—103.5 R **9 Claims**

1. A method of determining the presence or absence of endotoxins in liquids, which comprises:

a. admixing 1 part by volume of mammalian blood plasma, 0.1 to 0.5 parts by volume of mammalian blood platelet factor reagent, 0.1 to 0.4 parts by volume of Limulus polyphemus amebocyte lysate and 0.1 to 0.5 parts by volume of the liquid for determination; said plasma being first diluted in a ratio of from 1:4 to 1:15 (v/v) with an aqueous buffer solution;

b. incubating the mixture obtained in (a) above at 37° C. for 10 minutes;

c. admixing a source of calcium ions with the incubated mixture of (b) above;

d. incubating the mixture of (c) above at 37° C. for from 5 to 20 minutes;

e. disrupting the mixture obtained by incubating in (d) above;

f. separating solids from the disrupted mixture to obtain a supernatant;

g. mixing aliquots of the supernatant, a source of calcium ions and mammalian blood plasma;

h. measuring the elapsed time between completion of mixing in step (g) above and coagulation of the mixture obtained thereby; and

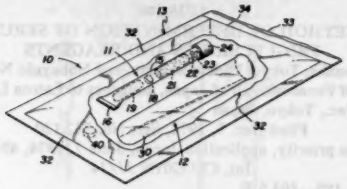
i. comparing the elapsed time measured in step (h) above with the elapsed time measured after following the steps (a) through (h) above but replacing the liquid for determination added in step (a) with an equal proportion of a known endotoxin free solution.

4,038,148

ANAEROBIC ENVIRONMENTAL SYSTEM FOR BACTERIA CULTURE TESTING

Lowell Donald Miller, Kansas City, Mo.; Melvin Wayne Hounsell, Beloit, Wis., and Ernest Elliott Spinner, Grandview, Mo., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 22, 1975, Ser. No. 643,258
Int. Cl.[2] C12B 1/00; C12K 1/10
U.S. Cl. 195—127 35 Claims



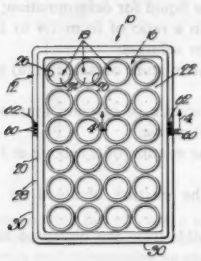
1. A package for storing and transporting an anaerobic culture comprising:
a bag of flexible sheet material of low gas permeability;
a self-contained gas generating apparatus in the bag for generating at least a reducing gas;
a culture retaining receptacle in the bag; and
a catalyst in the bag which promotes reaction between the reducing gas, when produced by the gas generating apparatus, and oxygen in the bag;
said gas generating apparatus comprising a container having an opening, a reducing gas generating solid material in the container, an ampoule containing a liquid which is reactive with the solid material to produce a reducing gas catalytically reactive with oxygen at room temperature, said ampoule being openable from outside the container to free the liquid to contact the solid material, and means in the container which prevents liquid from flowing from the container after the ampoule is opened but which permits flow of reducing gas generated in the container out of the opening.

4,038,149

LABORATORY TRAYS WITH LOCKABLE COVERS

John Liner, Woodbridge, and Eric W. Soderberg, Milford, both of Conn., assignors to Linbro Scientific, Inc., Hamden, Conn.

Filed Dec. 31, 1975, Ser. No. 645,550
Int. Cl.[2] C12B 1/00
U.S. Cl. 195—127 5 Claims



1. A laboratory unit, comprising a tray with a top surface, a bottom, an upright circumferential wall extending from said top surface to said bottom, and a plurality of cup formations extending downwardly from, and being open at, said top surface; and a removable cover having a top wall and a therefrom depending circumferential skirt overlapping said circumferential tray wall in closed cover position in which said top walls rests on said top surface of said tray, with said tray also having pad formations with outer faces on said circumferential wall on opposite sides thereof and extending substantially from said tray bottom heightwise to a level within the confines of said cover skirt in closed cover position, and said cover skirt having notches with which said pad formations register in closed cover position for clearance from said cover skirt and reach of said pad faces in their entirety by an attendant's fingers for secure grasp by the latter of the covered tray.

4,038,150

SAMPLE MIXING AND CENTRIFUGATION APPARATUS

Gordon L. Dorn, and Joseph M. Hill, both of Dallas, Tex., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Mar. 24, 1976, Ser. No. 669,764
Int. Cl.[2] C12K 1/04
U.S. Cl. 195—127 53 Claims

1. A fluid mixing apparatus comprising:
a. a receptacle having a first end and a second end, said ends being sealably closed so as to define a sample receiving chamber which is maintained at a lower than atmospheric pressure;
b. an injectable closure means sealably communicating with said first end of said receptacle;
c. an enclosed treating fluid chamber contained within said injectable closure means defined by sidewalls enclosed by first and second spaced injectable webs, said chamber being positioned therein such that a stylus may pass through said first and second spaced injectable webs, said treating fluid chamber and into said sample receiving chamber;
d. a sample treating fluid disposed within said treating fluid chamber; and
e. injection stylus means for passing through said injectable closure means and into said sample receiving chamber via said first and second injectable webs and through said treating fluid chamber for injecting a sample fluid into said sample receiving chamber and for admixing said sample treating fluid from said treating fluid chamber with said sample fluid as said sample fluid passes therethrough.

4,038,151

CARD FOR USE IN AN AUTOMATED MICROBIAL DETECTION SYSTEM

Norman L. Fadler, St. Louis; Paul W. Jones, and Jack R. Kirchner, both of St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 29, 1976, Ser. No. 709,611
Int. Cl.[2] C12K 1/10
U.S. Cl. 195—127 10 Claims

1. In card for use in detecting the presence of microbes in a specimen wherein the card is comprised of a plate having first and second sides, detection wells for containing microbe supportive media passing from a first side to a second side therethrough, at least one filling port with a septum therein, filler passageways formed in said first side of the plate connecting said filling port to said detection wells and adhesive tape on

both sides of the plate to cover said detection wells and filler passageways, the improvement comprising:

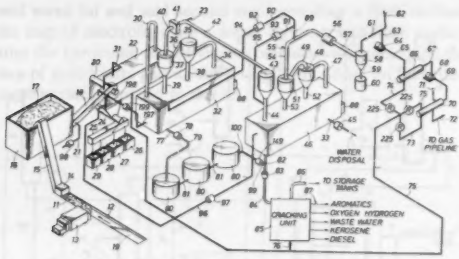
at least one discontinuity in one of said filler passageways adjacent a detection well.

4,038,152

PROCESS AND APPARATUS FOR THE DESTRUCTIVE DISTILLATION OF WASTE MATERIAL

Lyle D. Atkins, Houston, Tex., assignor to Wallace-Atkins Oil Corporation, Houston, Tex.

Filed Apr. 11, 1975, Ser. No. 567,193
Int. Cl.[2] C10B *57/02, 47/20*
U.S. Cl. 201—2.5 **30 Claims**



1. A process for destructive distillation of waste material containing organic matter, comprising the steps of

shredding the waste material into pieces of predeterminded size,

continuously supplying said shredded materials to a sealed distillator compartment at a predetermined rate,

distributing said shredded material to a uniform predetermined depth for movement through said distillator compartment,

continuously moving said shredded material along a plurality of superposed generally horizontal paths through said sealed distillator compartment at a predetermined rate,

uniformly heating said shredded material along each of said superposed generally horizontal paths to a predetermined range of temperatures during vertical movement of said material through said distillator compartment to pyrolyze said shredded material,

controlling said temperature in said distillator compartment to about 650° F at a highest vertical level and at selectively increasing temperatures to about 1000° F at a lowest vertical level,

pyrolyzing said continuously moving materials for evolving volatile gases and vapors from said organic matter in said waste material,

continuously discharging the solid residue of said pyrolyzed organic waste materials from said sealed distillator compartment,

treating said residue discharged from said distillator compartment to separate said solid residue into charcoal and other carbonaceous products produced by pyrolyzing said organic matter, metals and other non-ferrous aggregates originally contained in said waste material,

continuously removing said evolved gases and vapors from said sealed distillator compartment,

maintaining said distillator and said evolved gases at atmospheric pressure,

cooling said removed gases for condensing a portion of said gases into liquid petroleum products and water,

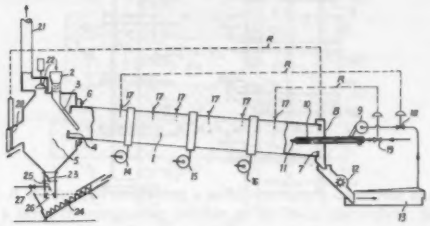
recovering said condensed water and liquid petroleum products, and recovering the remaining evolved gases.

4,038,153

COKE MANUFACTURING PROCESS

Jean Deruelle, St. Avold, and Olivier Penet, Forbach, both of France, assignors to Houilleres du Bassin de Lorraine, Freyming-Merlebach, France

Filed June 18, 1975, Ser. No. 588,172
Claims priority, application France, June 27, 1974, 74.22402
Int. Cl.[2] C10B *49/06, 57/12, 57/18*
U.S. Cl. 201—27 **5 Claims**



1. A manufacturing process for producing pulverulent coke and reactive coke in grain form, in which bituminous coal from fins and coal grains containing more than 15% volatile combustible matter with a swelling index ranging between 1 and 8 is carbonized at temperatures between about 600° and 1100° C in which process said bituminous coal is introduced at the higher end of a slightly inclined rotating tubular oven, through which oven the coke during the course of its production moves from the higher end to the lower end; in which process the heat of carbonization is obtained by the substantially simultaneous in situ generation and combustion of a part of the volatile combustible matter, by introducing an amount of air into the oven, which air is combustion air and which amount is in excess of a quantity of said air which would be necessary to bring the coke to the desired coking temperature, the majority of said air being introduced into the oven at a position between the outlet for the coke and the location of the area of maximum temperature reached by the coke; and wherein an endothermic fluid is introduced at the lower end of the oven for selectively establishing the location of said area of maximum temperature in said oven, for cooling the coke between said location and said outlet and for maintaining the temperature of the gases issuing from the higher end of said oven at about 600° C.

4,038,154

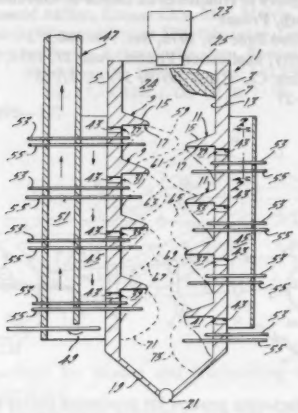
PILE FURNACE

Herbert L. Barnebey, Columbus, Ohio, assignor to Barnebey-Cheney Co., Columbus, Ohio

Continuation of Ser. No. 188,213, Oct. 12, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 402,970
Int. Cl.[2] C10B *51/00*
U.S. Cl. 202—93 **1 Claim**

1. In a furnace for the controlled combustion of a mass of carbonaceous particulate material, a furnace housing having an inlet at one end for material to be treated and an outlet at the other end for treated material, means for supporting said material in a pile in said furnace housing so that said material can flow from the inlet to the outlet, means in said housing providing a series of vent chambers spaced from each other in the direction of flow of material, said furnace including an exhaust stack, outlet means for said vent chambers connecting said chambers to said stack, and means for admitting combustion air

to the pile and to the chambers, said stack including a downflow portion and an upflow portion and means for the admission of air to the stack to provide for the combustion of combustible gases in the stack.

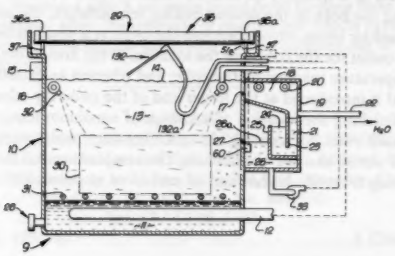


4,038,155

ENERGY SAVING VAPOR DEGREASING APPARATUS

Russell H. Reber, Orange, Calif., assignor to Purex Corporation Ltd., Lakewood, Calif.

Filed Apr. 5, 1976, Ser. No. 673,606
Int. Cl.[2] B01D *3/00*
U.S. Cl. 202—170 **15 Claims**



1. In combination with work degreasing apparatus including a tank defining an interior sump zone for liquid solvent, and a heater located to transfer heat to the solvent to vaporize same for degreasing contact with work introduced into the tank, the vapor being subject to condensation, there also being a tank cover having open and closed positions, the improvement comprising:

a. first means operatively connected with the heater and located to be responsive to closing of the cover to control the heater to reduce heat transfer to the liquid solvent, and also responsive to opening of the cover to control the heater to increase heat transfer to the liquid solvent.

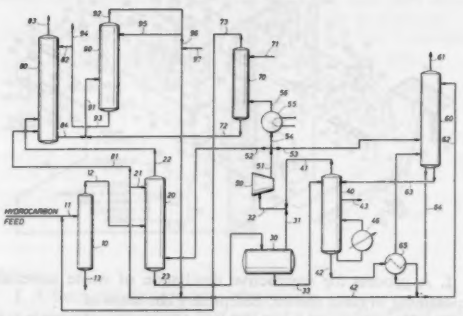
4,038,156

BUTADIENE RECOVERY PROCESS

Robert F. Knott, and Arthur E. Handlos, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 21, 1976, Ser. No. 725,065
Int. Cl.[2] B01D *3/40*; C07C *7/08*
U.S. Cl. 203—45 **8 Claims**

1. In the process for recovery of butadiene from a hydrocarbon mixture made up predominantly of C_4 hydrocarbons and containing a minor amount of C_5 saturated and unsaturated hydrocarbons, said mixture being obtained as overhead product from an initial fractionation step employed to separate larger quantities of C_5 and higher hydrocarbons from the C_4 hydrocarbon fraction, wherein the hydrocarbon mixture is subject to extractive distillation in the presence of a selective polar solvent and butadiene is separated from the fat solvent bottoms of extractive distillation by sequential flashing and stripping of the fat solvent in low pressure flashing and stripping zones operated at pressures lower than that employed in the extractive distillation to afford vapor products containing predominantly butadiene, a relatively high concentration of C_5 hydrocarbons and a minor amount of polar solvent, followed by compression of the combined overhead vapor products of low pressure flashing and stripping and passage of a portion of the compressed vapor product to a second stripping zone operated at a higher pressure for recovery of butadiene as



an overhead product with the remainder of the compressed vapor overhead being recycled as reboiled vapor to the extractive distillation step; the improvement which comprises,

a. condensing a portion of the combined vapor overhead product of compression into a liquid stream,

b. water washing the condensed liquid stream obtained in step (a) to remove polar solvent therefrom leaving a condensed liquid product containing butadiene and a relatively high concentration of C_5 saturated and unsaturated hydrocarbons which is substantially free of polar solvent,

c. returning the condensed liquid product from step (b) substantially free of polar solvent to the initial fractionation step employed to separate larger quantities of C_5 and higher hydrocarbons from the C_4 hydrocarbon fraction whereby C_5 saturated and unsaturated hydrocarbons contained in the condensed liquid are substantially removed from the hydrocarbon mixture passed to extractive distillation.

4,038,157

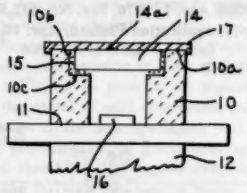
METHOD OF HERMETICALLY SEALING SEMICONDUCTOR DEVICES

Chung K. Kim, Lexington, Mass., and Yung L. Cho, Hauppauge, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 16, 1976, Ser. No. 677,589
Int. Cl.[2] C25D *5/10, 5/54*
U.S. Cl. 204—16 **2 Claims**

1. An electroplated microwave encapsulation process for a semiconductor being comprised of the step of forming a dielectric sleeve of ceramic for microwave utilization having an inner and outer circumference, a two step structure at one end and a flat surface at the other end, the two step structure having the first step thereof extending partially outwardly from the inner circumference toward the outer circumference of the dielectric sleeve, the first and second step being interconnected to form a rim, the step of metallizing with platinum the surfaces of the two step structure, the flat end of the dielectric sleeve and the outer circumference of the dielectric sleeve,

the step of brazing the metallized dielectric flat end onto a metal stud in the form of a brazed joint with said semiconductor being positioned in the center of the brazed joint, painting the surface of the first step and the rim with a viscose conductive material, placing a metal lid having a top surface with said first step and fitting tightly into said rim, said top surface of



said metal lid and said second step providing a flush surface, the step of electroforming a metal layer on said flush surface after the hardening of said viscose conductive material, and the step of gold barrel plating for final gold finishing on the entire metal surface exposed to the air.

4,038,158

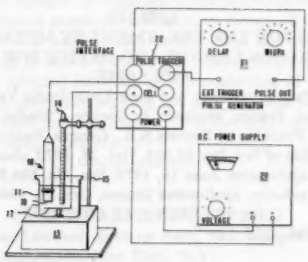
ELECTROCHEMICAL GENERATION OF FIELD DESORPTION EMITTERS

Maurice M. Bursey, Chapel Hill, N.C.; Deborah M. Hinton, Champaign, Ill.; Martin C. Sammons, Cincinnati, Ohio, and R. Mark Wightman, Lawrence, Kans., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1975, Ser. No. 624,102

Int. Cl.[2] C25D *5/18, 5/00, 7/00*

U.S. Cl. 204—23 **15 Claims**



1. A process for forming a field desorption emitter comprising a metal support and a plurality of metallic dendrites attached to and extending in a generally radially outwardly extending direction from said support, said process comprising the steps of:

a. forming an electrolytic liquid mixture having an appropriate concentration of a compound of the metal from which the dendrites are to be formed;

b. immersing said support, as a first electrode, in said mixture;

c. immersing a second electrode in said mixture in electrodepositing association with said support; and

d. applying a plurality of short duration pulses of electrical current with substantially zero current between said pulses across said electrodes.

4,038,159

METHOD FOR FABRICATION OF MANGANESE OXIDE SOLID ELECTROLYTE CAPACITOR

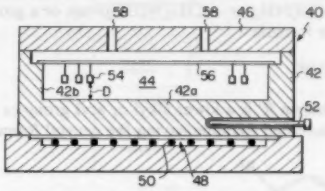
Atsushi Nishino; Hayashi Hayakawa, and Hiroshi Kumano, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 14, 1975, Ser. No. 632,079

Claims priority, application Japan, Nov. 19, 1974, 49-133999

Int. Cl.[2] H01G *9/05*

U.S. Cl. 204—38 A **15 Claims**



1. A method of producing a solid electrolyte capacitor having a layer of manganese dioxide as the solid electrolyte, the method comprising the steps of:

a. preparing a substrate by forming a dielectric oxide coating on a surface of a valve metal member;

b. immersing said substrate in an aqueous solution consisting of water and manganese nitrate; and

c. heating the wet substrate to cause pyrolytic decomposition of manganese nitrate to manganese dioxide in a heating chamber of a radiant furnace, said chamber being semi-closed and in communication with the atmosphere exclusively through at least one vent formed in the wall of said chamber, heat for said pyrolytic decomposition being transferred to said substrate exclusively from the wall of said chamber dominantly by radiation, said at least one vent having a predetermined area such that said pyrolytic decomposition proceeds under a positive pressure ranging from 5 to 100 mm H_2O in gage pressure attributable only to a relatively prolonged retention of gaseous decomposition products of said pyrolytic decomposition in said chamber.

4,038,160

METHOD OF REGENERATING A CHROMIUM ELECTROPLATING BATH

John Cooper Crowther, Stourbridge, and Stanley Renton, Penkridge, both of England, assignors to Albright & Wilson Limited, Oldbury, Warley, England

Filed July 2, 1976, Ser. No. 702,374

Claims priority, application United Kingdom, July 3, 1975, 28055/75

Int. Cl.[2] C25D *3/06;* **B01D** *9/02*

U.S. Cl. 204—51 **6 Claims**

1. A method for the maintenance of an aqueous trivalent chromium electroplating bath whose performance has deteriorated due to the accumulation of trace metals which consists in adding thereto an amount of a water soluble ferrocyanide effective to restore said performance.

4,038,161

ACID COPPER PLATING AND ADDITIVE COMPOSITION THEREFOR

William Edward Eckles, Cleveland Heights, and Thomas Walter Starinshak, Berea, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

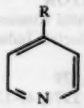
Filed Mar. 5, 1976, Ser. No. 664,278

Int. Cl.[2] C25D *3/38*

U.S. Cl. 204—52 R **20 Claims**

10. In an acid copper electroplating bath containing one or more copper salts, free acid and chloride ions, the improvement which comprises the presence in said bath of an effective amount of one or more bath-soluble organic leveling compounds obtained by reacting one or more epihalohydrins with one or more nitrogen-containing compounds selected from the group of

a. substituted pyridines having the general formula

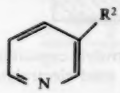


wherein R is a lower alkyl, lower alkenyl, alkylene amine, alkylenol, mercapto, cyano, alkylene-4-pyridyl, $-C(S)NH_2$, or $-CH=NOH$ group, or a group having the formula

$-C(O)R'$

wherein R' is a lower alkyl or aryl group or $-N(Et)_2$,

b. a substituted pyridine having the general formula



wherein R^2 is an amino, chloro, or β-acrylic acid group,

c. 2-vinyl pyridine,

d. 2-methyl-5-vinyl pyridine,

e. quinoline or 3-amino quinoline,

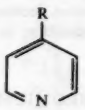
f. isoquinoline, or

g. benzimidazole.

18. An additive composition for acid copper electroplating baths comprising an aqueous mixture of

a. one or more bath-soluble leveling compounds obtained by reacting one or more epihalohydrins with one or more nitrogen-containing compounds selected from the group consisting of

i. substituted pyridines having the general formula

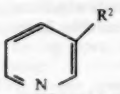


wherein R is a lower alkyl, lower alkenyl, alkylene amine, mercapto, cyano, alkylene-4-pyridyl, $-C(S)NH_2$, or $-CH=NOH$ group, or a group having the formula

$-C(O)R'$

wherein R' is a lower alkyl or aryl group or $-N(Et)_2$,

ii. a substituted pyridine having the general formula



where R^2 is an amino, chloro, or β-acrylic acid group,

iii. 2-vinyl pyridine,

iv. 2-methyl-5-vinyl pyridine,

v. quinoline or 3-amino quinoline,

vi. isoquinoline, or

vii. benzimidazole,

b. one or more bath-soluble brighteners containing

i. a carbon-sulfur group in which the carbon atom is attached to at least one other sulfur or nitrogen atom, and

ii. a hydroxyl group, a carboxylic acid or sulfonic acid group or the water-soluble alkali metal salts of said acids, and

c. a wetting agent.

4,038,162

METHOD AND APPARATUS FOR DETECTING AND ELIMINATING SHORT-CIRCUITS IN AN ELECTROLYTIC TANK

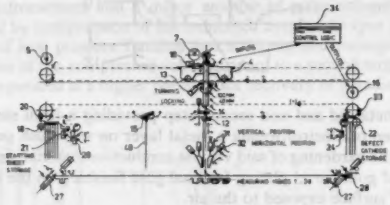
Aarne Albin Kapanen, Espoo, and Pentti Jaakkima Rautimo, Helsinki, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Apr. 1, 1976, Ser. No. 672,662

Claims priority, application Finland, Apr. 10, 1975, 751086

Int. Cl.[2] C25C *1/00, 7/06*

U.S. Cl. 204—105 R **11 Claims**



1. A method for detecting and eliminating short-circuits in an electrolytic tank in which anode plates and cathode sheets have been immersed alternately at predetermined intervals, each cathode sheet being connected to a cathode bar which is in contact with a conductor rail of the tank, said method comprising

determining the total current of a cathode by observing a suitable current-depending quantity, such as the magnetic field, the temperature or similar, of the cathode bar,

recognizing a short-circuit condition when the determined cathode current exceeds a predetermined value,

upon the detection of a short-circuit condition, and responsive thereto, directing an automatic cathode-replacing device, movable along the cathode/anode row, to the position of the detecting short-circuit condition and stopping it above said position,

lifting up the short-circuit cathode and moving it away, and lowering a new cathode sheet to replace the one removed.

4,038,163

PROCESS FOR THE TREATMENT BY METALLIC IONS OF AQUEOUS LIQUIDS AND DEVICE FOR MAKING THE SAME

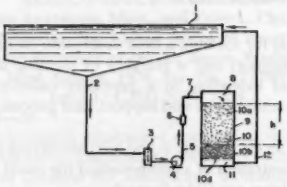
Lorenzo Puig Casanovas, and Jean Leon Justin Vellas, both of Toulouse, France, assignors to Societe d'Etudes et de Diffusion de Procedes et Brevets S.A., Geneva, Switzerland

Continuation of Ser. No. 84,861, Oct. 28, 1970, abandoned. This application June 16, 1975, Ser. No. 586,890

Claims priority, application France, Oct. 28, 1969, 69.369711

Int. Cl.[2] C02B *1/82;* C02C *5/12*

U.S. Cl. 204—152 **4 Claims**



1. A process for purifying an aqueous liquid containing impurities, comprising the steps of:

passing the aqueous liquid in a uniformly distributed manner between electrodes formed of a single metal the ions of which are capable of effecting both the formation of fine flocculates of impurities and sterilization,

continuously subjecting said electrodes to an electric current to effect uniformly scattered emission of monometallic ions through the aqueous liquid thus causing the formation of fine flocculates of the impurities in the aqueous liquid,

retaining the fine flocculates in the form of a porous mass,

continuing to circulate aqueous liquid through said porous mass whereby further flocculated impurities contained therein are deposited and retained in said porous mass to increase the volume thereof;

applying sufficient current to said electrodes to provide said monometallic ions emission at a rate such that a number of free ions sufficient to provide an algicidal or biocidal effect, of the metal of said electrodes, pass through the porous mass with the aqueous liquid, and

washing the porous mass of flocculates upon reaching a determined threshold of pressure drop for the aqueous liquid passing through said porous mass,

whereby said aqueous liquid is epurated by action of flocculates continuously energized by the emission of said monometallic ions, additional ions of said metal of said electrodes going through said porous mass further providing sterilization properties to said epurated aqueous liquid.

4,038,164

PHOTOPOLYMERIZABLE ARYL AND HETEROCYCLIC GLYOXYLATE COMPOSITIONS AND PROCESS

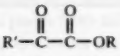
Francis A. Via, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 18, 1975, Ser. No. 614,469

Int. Cl.[2] C08F *8/00, 2/46*

U.S. Cl. 204—159.15 **23 Claims**

1. In the polypolymerization of monomeric and polymeric compositions of photopolymerizable substances wherein a photoinitiator is admixed with a photopolymerizable composition and the mixture exposed to actinic radiation, the improvement wherein photopolymerization is effectively initiated by a compound of the formula:



wherein R is straight or branched chain hydrocarbon of from one to ten carbon atoms, aryl, aralkyl, or mono-, di or trialkylsilyl and R′ is a heterocyclic radical, aryl of from 6 to 14 carbon atoms or mono-, di- or polysubstituted phenyl with substituents selected from the group consisting of alkyl, alkoxy, aryloxy, alkylthio, arylthio and halogen, said photoinitiator being present in said composition at a concentration of 0.01 to about 30 weight percent.

4,038,165

CORONA REACTION METHOD

Frank Eugene Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,046, March 13, 1975. This application Nov. 17, 1975, Ser. No. 632,580

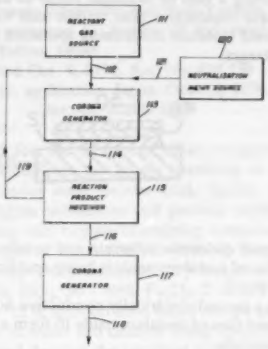
Int. Cl.[2] C01B *13/11*

U.S. Cl. 204—176 **17 Claims**

1. A method for conducting corona discharge reactions between spaced opposing electrodes each having an exposed dielectric surface having a thickness of from about 0.1 to about 10.0 mm and a dielectric constant of from about 2.0 to about 200 relative to vacuum; and a dielectric strength sufficient to withstand applied voltage for forming therebetween a corona discharge gap comprising:

passing a reactant gas through said corona discharge gap:

periodically establishing a corona discharge between said gap by dissipating narrow pulse electrical power of high voltage in said gap with the width of said pulses being relatively small compared to the pulse period as well as being less than the gas ion transit time across said gap and greater than the electron transit time across said gap; and



removing gas ions from said gap before termination of each pulse period.

4,038,166

ELECTRODEPOSITABLE COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 277,931, Aug. 4, 1972, Pat. No. 3,937,679, and a continuation-in-part of Ser. No. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, abandoned, and Ser. No. 100,825, Dec. 22, 1970, abandoned, and Ser. No. 100,834, Dec. 22, 1970, abandoned, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of said Ser. No. 100,825, and said Ser. No. 100,834, and Ser. No. 210,141, Dec. 20, 1971, abandoned, and Ser. No. 217,278, Jan. 2, 1972, abandoned, and said Ser. No. 100,825, and said Ser. No. 100,834, is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 129,267, is a continuation-in-part of said Ser. No. 100,825, which is a continuation-in-part of said Ser. No. 56,730. This application Nov. 13, 1975, Ser. No. 631,779

Int. Cl.[2] C25D *15/00*

U.S. Cl. 204—181 **15 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, and anode and an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of

a. a quaternary onium salt group solubilized synthetic organic resin, wherein the onium group is selected from the group consisting of ammonium, sulfonium, and phosphonium, and

b. 2 to about 30 percent by weight based on total weight of (a) and (b) of an amine/aldehyde condensate.

4,038,167

METHOD OF FORMING A THIN FILM CAPACITOR

Peter L. Young, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,527

Int. Cl.[2] C23C *15/00*; H01G *4/10*

U.S. Cl. 204—192 D **10 Claims**

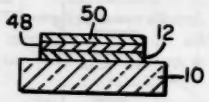
1. A method of forming a capacitor comprising the sequential steps of

providing a dielectric substrate,

applying to said dielectric substrate a first electrically conductive non-tantalum film to form a first capacitor electrode,

disposing said substrate and conductive film within a vacuum environment containing an oxygen-nitrogen-inert gas mixture,

r-f sputtering a film of tantalum oxide of desired thickness over said conductive film within said vacuum environment, said tantalum oxide being sputtered from a tantalum oxide target,



cooling said dielectric substrate and conductive film while said film of tantalum oxide is being sputtered thereon, and thereafter

applying a second electrically conductive non-tantalum film over said film of tantalum oxide to form a counter capacitor electrode.

10. A thin film capacitor formed by the method of claim **1.**

4,038,168

GALVANIC ANODE TYPE CATHODIC PROTECTION APPARATUS

Tadamasa Higuchi, Sayama; Morihiko Kuwa, Ageo, and Hiroshi Saito, Sakado, all of Japan, assignors to Nakagawa Corrosion Protecting Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,821
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—197 **13 Claims**

1. A galvanic anode type cathodic protection apparatus, wherein a hollow rod having a lengthwise streak of continuous opening is installed as the guide on a part of a structural member, a single sacrificial anode or a continuity of at least 2 sacrificial anodes each having a core and a fitting attached to said core and supported by said guide in a manner as to be free from slipping out of said opening and a stopping plate provided at one end of the guide having a holder holding one end of the core or the fitting in the case of a single anode, or one end of the core or the fitting at one extremity of the continuity of anodes in the case of more than one anode.

4,038,169

INDEXING SYSTEM

Curtis N. Lovejoy, Walpole; Leo N. Kosowsky, Sharon, and Paul C. Holte, Canton, all of Mass., assignors to National Plastics & Plating Supply, Terryville, Conn.

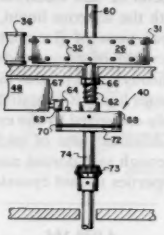
Filed Feb. 18, 1975, Ser. No. 550,348
Int. Cl.[2] C25D *5/02, 17/00*
U.S. Cl. 204—202 **3 Claims**

1. In apparatus for electroplating pre-selected portions of a continuous metallic strip and of the type comprising means to intermittently advance said strip a precise distance through an electroplating station between electroplating sequential portions thereof, the improvement wherein said means to achieve said intermittent advance comprise

A. an indexing wheel carrying a plurality of projections thereon adapted to engage a mating series of holes in said strip to be electroplated, means for intermittently driving said wheel comprising

1. a continuously driven friction clutch means

2. means to engage said driven clutch with said indexing wheel at the end of each electroplating cycle,



3. means to disengage said clutch after a single predetermined distance of travel of said indexing wheel and

B. a constant tension wheel carrying a plurality of projections also adapted to engage a mating series of holes in said strip, and a constant-tension drag clutch means adapted to maintain a predetermined constant tension on said constant-tension wheel during the advancement thereof,

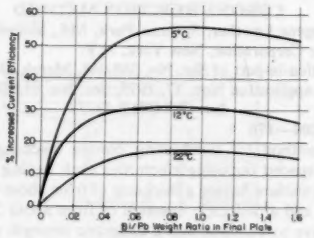
C. and wherein said indexing wheel and said tension wheel are positioned on opposite sides of said electroplating station.

4,038,170

ANODE CONTAINING LEAD DIOXIDE DEPOSIT AND PROCESS OF PRODUCTION

Raymond C. Rhees, 147 Ivy, Henderson, Nev. 89015, and Bruce B. Halker, 657 6th St., Boulder City, Nev. 89005

Filed Mar. 1, 1976, Ser. No. 662,632
Int. Cl.[2] C25B *1/34, 1/26, 1/30, 11/06*
U.S. Cl. 204—290 R **9 Claims**



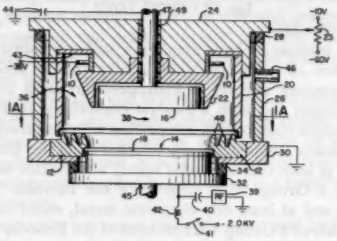
1. An anode comprising a substrate having a continuous adherent deposit of lead dioxide containing bismuth in an amount sufficient to provide a ratio of bismuth to lead in the deposit of at least about $1:10^2$ and being sufficient to increase the current efficiency of the anode at temperature of use below 25° C, and/or to decrease lead loss from the anode surface.

4,038,171

SUPPORTED PLASMA SPUTTERING APPARATUS FOR HIGH DEPOSITION RATE OVER LARGE AREA

Ronald W. Moss; Edwin D. McClanahan, Jr., and Nils Laegreid, all of Richland, Wash., assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Mar. 31, 1976, Ser. No. 672,402
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 15 Claims



1. Sputtering apparatus comprising:

cathode means for emitting electrons;

annular anode means spaced from the cathode means by an electron discharge region through which said electrons pass from said cathode to said anode;

target means for supporting target material to be sputtered, said target means being surrounded by said annular anode and separate therefrom;

substrate support means separate from said anode and spaced from said target means by a sputter region through which sputtered material passes from said target to said substrate;

means for providing sputtering gas in the said electron discharge region and said sputter region which is ionized by said electrons to produce a plasma including positive ions of said sputtering gas which bombard said target to sputter the material thereon from said target onto said substrate;

plasma shaping electrode means surrounding said target and said substrate, said plasma shaping electrode being separate from said anode and electrically insulated therefrom; and

means for applying an electrical potential to said plasma shaping electrode means different than the potential applied to said anode to produce electrical fields in the electron discharge region and the sputter region, said electrical fields repelling electrons from said shaping electrode to said anode and shaping said plasma to cause said positive ions to be distributed more uniformly over a large target area.

15. Sputtering apparatus comprising:

cathode means for emitting electrons;

anode means spaced from said cathode so that said electrons bombard said anode;

substrate means;

main target means for sputtering material from said target means onto said substrate means when said target means is bombarded with positive ions of sputtering gas; and

auxiliary target means separate from said main target and positioned adjacent to said anode, for sputtering electrically conductive material from said auxiliary target onto said anode to compensate for any insulative material sputtered onto said anode from said main target and to maintain a conductive surface on said anode.

4,038,172

METHOD FOR REMOVAL OF OXYGEN FROM OXYGEN-CONTAINING COMPOUNDS

Shigeru Ueda; Shinichi Yokoyama; Yoshinori Nakata; Yoshihisa Hasegawa; Yosuke Maekawa, and Yuji Yoshida, all of Sapporo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 9, 1975, Ser. No. 621,134
Claims priority, application Japan, Oct. 16, 1974, 49-119718
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 1 Claim

1. A method for the treatment of an oxygen-containing compound selected from the group consisting of bituminous coal, sub-bituminous coal, brown coal, lignite, grass peat, wood, paper, lignin substances and petrolic asphalts, which comprises mixing said oxygen-containing compound with 10 to 100% by weight of water and 1 to 10% by weight of a red clay catalyst composition comprised, by weight, of 18 - 25% Al_2O_3, 15 - 20% SiO_2, 30 - 40% Fe_2O_3, 2 -8% TiO_2 and approximately 8 - 12% ignition loss, based on the composition, the percentages of water and catalyst being respectively based on said compound, heating the resultant mixture at a temperature in the range of from 250 to 500°C and simultaneously compressing the mixture with carbon monoxide to 1 to 300 atmospheres for one to 100 minutes and thereby removing the oxygen from said compound and at the same time converting said compound into an organic substance of a lower molecular weight.

4,038,173

HYDROCRACKING PROCESS USING PLATINUM/ALUMINA CATALYST ACTIVATED AND COOLED WITH HCl

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 664,217, March 5, 1976, Pat. No. 4,003,956, Division of Ser. No. 458,700, April 8, 1974, Pat. No. 3,970,589. This application Sept. 29, 1976, Ser. No. 727,921
Int. Cl.[2] C10G *13/08;* B01J *27/06*
U.S. Cl. 208—112 10 Claims

1. A hydrocarbon conversion process which comprises contacting a hydrocarbon under hydrocracking conditions with an active alumina supported platinum catalyst prepared by contacting said catalyst at a temperature within the range of 600°-1500° F with a dry activating gas comprising 30 to 100 volume percent anhydrous hydrogen chloride for at least 0.1 hour; and thereafter cooling the thus-activated catalyst for a time of at least 0.5 hour in the presence of a dry carrier gas containing 1 to 20 volume percent anhydrous hydrogen chloride.

4,038,174

HYDROCARBON CONVERSION USING GROUP VIII METAL/ALUMINA CATALYSTS ACTIVATED WITH HALOSILANE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 546,819, Feb. 3, 1975, Pat. No. 3,993,594. This application Sept. 7, 1976, Ser. No. 720,522
Int. Cl.[2] C10G *13/08;* C07C *5/24*
U.S. Cl. 208—112 16 Claims

1. A hydrocarbon skeletal isomerization process which comprises:

a. contacting an isomerizable hydrocarbon selected from the group consisting of acyclic paraffin and naphthene under isomerization conditions with a catalyst produced by (1) heating an active alumina-supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst to a temperature of greater than 1200° F in an atmosphere selected from the group consisting of nitrogen, hydrogen, and mixtures of nitrogen and hydrogen; (2) holding said heated catalyst in said atmosphere at said temperature of greater than 1200° F for at least ; 10

minutes (3) contacting said catalyst at said temperature of greater than 1200° F with a dry activating gas comprising a halosilane selected from the group consisting of chlorosilanes and bromosilanes for a time sufficient to incorporate a halide content to the catalyst and to increase the activity of the catalyst, said contacting step (3) being carried out in the absence of air; (4) cooling said halosilane contacted catalyst of step (3), and

b. recovering an isomerized hydrocarbon from step (a).

13. A hydrocarbon hydrocracking process which comprises:

a. contacting a hydrocarbon under hydrocracking conditions with an active alumina-supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst activated by (1) heating said catalyst to a temperature of greater than 1200° F in an atmosphere selected from the group consisting of nitrogen, hydrogen, and mixtures of nitrogen and hydrogen; (2) holding said heated catalyst in said atmosphere at said temperature of greater than 1200° F for at least 10 minutes; (3) contacting said heated catalyst of step (2) at said temperature of greater than 1200° F with a dry activating gas comprising a halosilane selected from the group consisting of chlorosilanes and bromosilanes for a time sufficient to incorporate a halide content to the catalyst and to increase the activity of the catalyst, said contacting step (3) being carried out in the absence of air; (4) cooling said halosilane contacted catalyst of step (3), and

b. recovering a hydrocracked product from step (a).

4,038,175

SUPPORTED METAL CATALYST, METHODS OF MAKING SAME, AND PROCESSING USING SAME

Madan Mohan Bhasin, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,721, Sept. 23, 1974, abandoned, Ser. No. 508,709, Sept. 23, 1974, abandoned, and Ser. No. 488,497, July 15, 1974, abandoned. This application Dec. 31, 1975, Ser. No. 645,715

Int. Cl.[2] C10G *23/04*

U.S. Cl. 208—144 **11 Claims**

1. In a process for the hydrogenation of dripolene in which dripolenes are hydrogenated in the presence of a hydrogenation catalyst, the improvement which comprises utilizing as the catalyst a composition consisting essentially of palladium or platinum metal dispersed on the surface of an alpha-alumina support, said support having the following characteristics:

a. a porosity of about 0.1 cubic centimeter to about 0.8 cubic centimeter per gram of support;

b. a surface area of about 0.1 square meter of about 10 square meters per gram of support; and

c. an average pore size of about 0.05 micron to about 100 microns, a major proportion of the pores having a pore size in the range of about 0.05 micron to about 10 microns

wherein the amount of palladium dispersed on the surface of the support is about 0.01 percent to about 1.0 percent by weight of metal based on the weight of the catalyst composition, and the amount of platinum dispersed on the surface of the support is about 0.02 percent to about 2.0 percent by weight of metal based on the weight of the catalyst composition; and

wherein at least about 7.5 percent of the total metal atoms dispersed on the surface of the support are exposed.

4,038,176

OIL SOLUBLE POLYMERIC FLOCCULANTS

Gerry K. Noren, Hoffman Estates, Ill., and Richard C. Diehl, Oakdale, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1976, Ser. No. 668,894

Int. Cl.[2] C10M *11/00*

U.S. Cl. 208—180 **6 Claims**

1. A method of reclaiming waste oils which comprises adding at least 0.01 percent, based on the weight of waste oil, of an oil soluble polymer to the waste oil in order to flocculate the colloidal suspensions contained in said oil, said oil soluble polymer having a molecular weight of a l least 10,000 and being selected from the group consisting of polymers of fatty diallyl quaternary ammonium salts and fatty acid salts of polymers of tertiary amino substituted acrylamides.

4,038,177

OIL HYDRODESULFURIZATION WITH ALUMINA COMPOSITE CATALYST UTILIZING ALUMINATE AND DICARBOXYLIC ACID IN ITS PREPARATION

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 19, 1976, Ser. No. 706,217

Int. Cl.[2] C07G *23/02*

U.S. Cl. 208—216 **7 Claims**

1. In a process of hydrotreating a sulfurcontaining heavy hydrocarbon oil reduce the sulfur content thereof which comprises contacting said oil as hydrodesulfurization conditions with hydrogen and with a catalyst comprising aluminia and hydrogenation components composited with said alumina, said hydrogenation components are selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a Group VI-B element of the Periodic Table of Elements and at least one elemental metal, metal oxide and metal sulfide of a Group VIII element of the Periodic Table of Elements the improvement which comprises said alumina having been prepared by the step which comprises reacting a solution of an aluminate selected from the group consisting of alkali metal aluminates and ammonium aluminate with an aqueous solution of an aliphatic dicarboxylic acid to precipitate a hydrous aluminum oxide.

4,038,178

APPARATUS FOR CONTROLLING DISCHARGE OF CLASSIFIED SAND FROM A HYDRAULIC CLASSIFIER

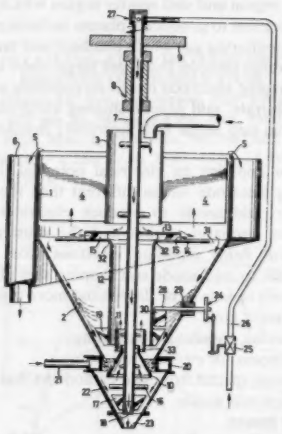
Risto Tapani Otakallio 1A 02150 Otaniemi, Finland

Filed Nov. 5, 1975, Ser. No. 629,067

Claims priority, application Finland, Nov. 19, 1974, 3339/74

Int. Cl.[2] B03B *5/66*

U.S. Cl. 209—161 **2 Claims**



1. An hydraulic classifier including means for discharging a particulate product comprising:

a. a vessel tapering in a downward direction and having means for discharging fines at the top and a bottom formed with an aperture;

b. a rotor in said vessel including

1. a shaft having an upright axis,

2. drive means for rotating said shaft about said axis,

3. an upwardly tapering, hollow member mounted on said shaft and upwardly spaced from said aperture, said member having an annular lower orifice and an annular upper orifice smaller than said lower orifice,
4. a flow tube mounted on said shaft for receiving liquid upwardly discharged from said upper orifice for upward flow,
5. agitating means projecting radially outward beyond said flow tube above said hollow member, and
6. means on said shaft below said hollow member for forcing cleaned particular product through said aperture;

c. washing means on said vessel for directing a liquid washing medium radially inward against said hollow member intermediate said orifices thereof, whereby said washing medium is deflected into said flow tube and draws additional liquid from said upper orifice,
1. said flow tube, said hollow member, and the lowermost portion of said shaft bounding an annular path for downward movement of a suspension of particulate material in liquid in a radially inward direction, said path being bounded by said vessel in a radially outward direction,
2. said agitating means projecting into said path; and

d. feeding means for feeding particulate material to a portion of said vessel above said flow tube.

4,038,179

HYDROCHLORIC ACID FLOTATION PROCESS FOR SEPARATING FELDSPAR FROM SILICEOUS SAND

Akira Katayanagi, No. 11-65, 3-chome, Sainokami, Yahatanishi, Kitakyushu, Japan (806)

Filed June 2, 1975, Ser. No. 582,828
The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **9 Claims**

1. A hydrochloric acid froth flotation process for separating feldspar from an ore containing feldspar and siliceous sand, which comprises finely dividing said ore into fine particles, suspending said particles in an aqueous solution of hydrochloric acid, adding to said suspension a flotation reagent composed of a petroleum sulfonated and an N-higher alkylalkylenediamine salt alone or in mixture with a higher alkylamine salt, blowing air into said suspension to produce froth, and thereafter recovering fedlspar from said froth.

4,038,180

PROCESS OF DEWATERING SEWAGE SLUDGE

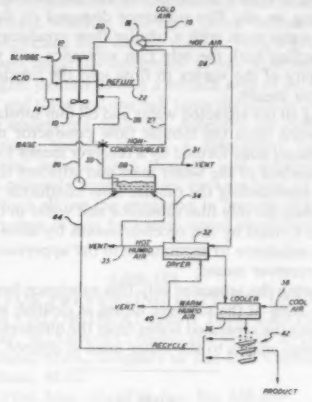
Norwood K. Talbert, Manlius, N.Y., assignor to Agway, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 526,134, Nov. 22, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,739
Int. Cl.² C02C *3/00*
U.S. Cl. 210—10 **10 Claims**

1. A process of dewatering noncompressible sewage sludge initially containing a known percentage by weight of water but no gaseous air phase to form an end product containing a predetermined percentage by weight of sludge solids, said process consisting essentially of:

a. physically mixing a quantity of sewage sludge having a water content sufficient to render it non-compressible with a quantity of mineral acid or anhydride thereof sufficient to extract substantially all of the water initially contained in the sludge to form a mixture of sludge solids and water diluted acid; and

b. placing in a reaction vessel said mixture and a base of a type and quantity sufficient to react with the acid or anhydride contained in said mixture to generate a reactive heat sufficient to remove by evaporation all of the water remaining in said mixture required to allow formation, without filtration, of a granular product comprising sludge solids and a salt.



4,038,181

PROCESS FOR DEWATERING SEWAGE SLUDGE

Norwood K. Talbert, Manlius, N.Y., assignor to Agway, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 526,134, Nov. 22, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,609
Int. Cl.² C02C *3/00*
U.S. Cl. 210—10 **6 Claims**

1. A process for dewatering previously unprocessed sewage sludge initially containing at least 75% water comprising:

a. contacting a quantity of unprocessed sludge with at least as great a quantity, by weight, of a chemical selected from the group consisting of urea and the common salts of ammonium and potassium;

b. allowing said sludge and chemical to remain in contact for a time sufficient for substantially all of said chemical to dissolve in water extracted thereby from the sludge to produce separation of said sludge and chemical into a liquid phase consisting of said chemical dissolved in water, and a solid or semi-solid phase of sludge solids with any remaining water; and

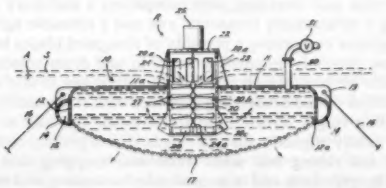
c. physically separating said phases by decantation of said liquid phase.

4,038,182

OIL SPILL RECOVERY METHOD AND APPARATUS

Richard Stuart Jenkins, 5821 Dolores, Houston, Tex. 77027

Continuation of Ser. No. 439,219, Feb. 4, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,505
Int. Cl.² E02B *15/04*
U.S. Cl. 210—23 R **25 Claims**



1. A method for recovering an immiscible oil substance

spread as in oil film over the surface of a water mass, comprising the steps of:

forming a vortex adjacent the surface of the water mass having an oily film substance disposed on the surface of the water mass with a tubular flow conductor means for attracting both the oily film substance and water in the vicinity of the vortex to flow into the tubular flow conductor means;

flowing all the attracted water and oil film substance radially outward from the tubular flow conductor means into a quiescent zone formed by a receiver means located below the surface of the water mass and adjacent the bottom of and surrounding the tubular flow conductor means;

separating the oily film substance and water in the quiescent zone formed by the receiver means by allowing the oily film substance to accumulate in the uppermost portion of the receiver means;

recovering the separated oily film substance from the quiescent zone of the receiver means as desired; and

returning the separated water from the quiescent zone of the receiver means to the water mass as desired.

4,038,183

FLOCCULATION PROCESS

John C. Davidtz, East Amwell Township, Hunterdon County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 633,521, Nov. 19, 1975, Pat. No. 3,996,696, which is a division of Ser. No. 443,540, Feb. 19, 1974, Pat. No. 3,956,119. This application Aug. 24, 1976, Ser. No. 717,306

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—47 **4 Claims**

1. A method of reducing the amount of above ground storage space needed to store fluid phosphate slimes waste obtained in the hydraulic mining of phosphate mineral, whereby a portion of said fluid waste having a solids content of at least 2 weight percent is treated by:

admixing the fluid waste with fertile topsoil to form about a 30 weight percent slurry of topsoil, said topsoil providing at least 50 parts per million, by weight of the total mixture of extractable organic flocculating agents; transporting and depositing said slurry in a settling area, whereby a sediment, that contains slimes solids, is formed; and separating and recovering water that has less than 2 weight percent solids from said settling area.

4,038,184

METHOD OF PROCESSING WASTE ON SHIPS AND THE LIKE AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Sven Elis Ake Svanteson, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

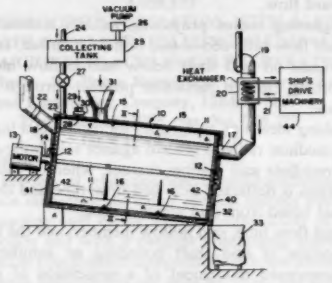
Filed Nov. 13, 1975, Ser. No. 631,538

Claims priority, application Sweden, Nov. 25, 1974, 7414795; Feb. 21, 1975, 7501974

Int. Cl.[2] B01D *1/14*

U.S. Cl. 210—59 **11 Claims**

7. A method for processing waste having one part in the form of solid waste and another separate part in the form of black water collected in a tank from a reduced-flush toilet; said method comprising introducing said solid waste into a treatment zone, said treatment zone comprising a stationary drum having a substantially horizontal axis and a rotatable agitator, said agitator comprising a plurality of elongated blades having notches, rotatably mounted to move in said drum adjacent to the inner surface thereabout the longitudinal axis of said drum, the bottom of said drum being provided with circumferentially extending ridges directed radially inward, and said notches being axially aligned with said ridges, disintegrating said solid waste and raising said solid waste and dropping said solid waste by gravity in said treatment zone by rotating said blades, heating said solid waste by passing a flow of hot air through said dropping disintegrated waste in said treatment zone said flow being introduced into the upper portion of one end of said stationary drum and being withdrawn from the upper portion of the other end of said stationary drum, mixing said solid disintegrated waste with said black water in said treatment zone whereby said solid disintegrated waste serves as a carrier and an exposure surface for the black water in said hot air flow,



continuing to rotate said blades and flow said hot air through said dropping solid disintegrated waste mixed with black water until substantially all waste in said treatment zone is a dry product, and removing said dry product from the bottom of said stationary drum.

4,038,185

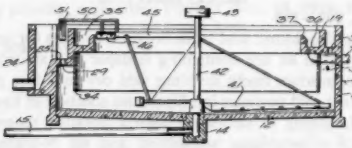
SCUM CONTROL SYSTEM FOR PERIPHERAL FEED CHANNEL OF SEDIMENTATION TANK

Kenneth J. Kline, Pewaukee, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Sept. 8, 1976, Ser. No. 721,258

Int. Cl.[2] B01D *21/24*

U.S. Cl. 210—83 **8 Claims**



1. In a sedimentation tank of the type having a peripheral feed channel provided within a series of lower ports opening into the tank and an effluent weir which maintains a given level of the liquid in the tank such that the level of the feed in the channel varies with the rate of flow in the channel and through the tank, a riser pipe having support means securing the pipe in the channel for discharge through a selected port in the terminal portion of the feed channel where scum collects following a period of lower flow rates, the upper end of the pipe being vertically adjustable to an elevation which corresponds with that of the scum following such periods whereby such scum is periodically removed on a daily basis.

4,038,186

CARBON DECANTER

Clyde E. Potter, Bellflower, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

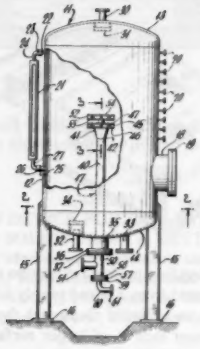
Division of Ser. No. 621,704, Oct. 14, 1975. This application Jan. 19, 1976, Ser. No. 650,385

Int. Cl.[2] B01D *11/02, 21/24*

U.S. Cl. 210—92 **9 Claims**

1. An apparatus for continuously separating by gravity a liquid feed stream comprising a mixture of particulate carbon, water and liquid organic extractant into a dispersion of particulate carbon-liquid organic extractant and clarified water, which dispersion floats on said clarified water at the interface

level comprising: a closed vessel having a substantially circular horizontal cross-section, an exit port in the upper portion of said vessel through which said liquid dispersion of particulate carbon and extractant is discharged, an exit port in the lower portion of said vessel through which said clarified water is simultaneously dicharged, outer conduit means entering said vessel and passing along the vertical axis, inner conduit means connected to a source of liquid organic extractant and concentric with said outer conduit and spaced therefrom to provide an annular passage which is connected to a source of said liquid



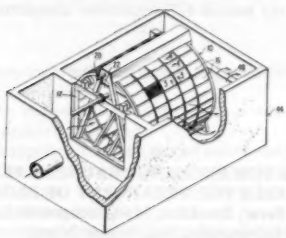
feed stream and through which said liquid feed stream is introduced into said vessel, a horizontally disposed first radial nozzle in communication with said annular passage and terminating said outer conduit means within said vessel along the vertical axis about ¼ to ¾ of the height of said vessel for distributing said liquid feed stream below said interface level, and a horizontally disposed second radial nozzle in communication with and terminating said inner conduit at a position above that of said first radial nozzle for distributing said stream of liquid organic extractant.

4,038,187

MICROSCREEN DRUM

Edward P. Saffran, Mukwonago, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Feb. 3, 1976, Ser. No. 654,811
Int. Cl.² B01D *33/06*
U.S. Cl. 210—108 **8 Claims**



1. In apparatus for screening a water supply or treated waste-water comprising a drum including **1)** a cylindrical microscreen, **2)** a rigid frame supporting said microscreen, and **3)** end means for introduction of the water to be screened into the interior of said drum, a tank surrounding said drum to receive the screened water from said drum and including means for maintaining a selected level of screened water within said tank, bearing means rotatably supporting said drum on a horizontal axis below said water level, drive means rotating said drum at a selected speed of rotation, said microscreen having exposed upward and downward moving sections above said water level and an uppermost backwash section, a backwash water supply system having a discharge means directly over said backwash section and a backwash receiving trough within said drum immediately beneath said backwash section, the improvement wherein said rigid frame includes radially outwardly projecting intersecting walls forming a grid pattern overlaying and integrally connected to said microscreen, the cells of the grid pattern having a surface area of between one and one half and three and one half times the surface area of the microscreen underlying each cell, whereby the cells of said upward moving section entrain a substantial volume of screened water which flows through said microscreen by gravity and provides supplemental backwashing of said microscreen which allows the apparatus to operate at low flows without operation of said backwash water supply system.

4,038,188

METHOD FOR PREVENTING EUTECTIC CAKING OF SODIUM CHLORIDE AT HIGH TEMPERATURES

James A. May, Sr.; Gerard C. Sinke, and Martin A. Langhorst, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1975, Ser. No. 558,402
Int. Cl.² B01D *57/00*
U.S. Cl. 210—20 **21 Claims**

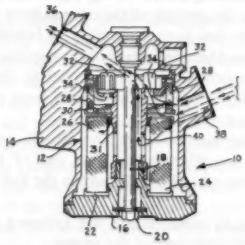
14. In a process for disposal of aqueous sodium chloride brine streams containing organic matter, of the type wherein the organic matter is oxidized in a fluidized bed reactor having a bed containing granular sodium chloride held in a fluidized state by an upflowing stream of gases from the conbustion of sulfur-containing fuels, the improvement which comprises: maintaining the bed of sodium chloride substantially free from sodium sulfate and sodium carbonate at temperatures within the range of from about 610° C to at least about 700° C by providing in the reactor an effective amount of at least one compound comprising calcium ion to react with sodium sulfate and sodium carbonate present and with additional components in the stream of gases which would otherwise react to form either of sodium sulfate or sodium carbonate.

4,038,189

FLUID DUAL FILTER

James R. Dison, and George A. Thomson, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,764
Int. Cl.² B01D *35/14*
U.S. Cl. 210—90 **1 Claim**



1. A fluid dual filter comprising a housing, said housing comprising a body and a base plate, said body and said base plate being removably secured together by a central tie bolt and nut, said body having a fluid inlet and a fluid outlet, said fluid outlet being positioned vertically above said fluid inlet, a primary filter means in the form of a fine mesh filter element being removably mounted within said body on said base plate, a secondary filter means in the form of a coarse mesh filter element mounted within said body, said secondary filter ele-

ment being mounted vertically above said primary filter element to prevent contamination of said secondary filter element by contaminants trapped on the surface of said primary filter element, said primary and secondary filter means being located between said inlet and said outlet, a plurality of bypass valves being located within said body between said secondary filter means and said outlet, said valves being constructed and arranged to prevent fluid from passing through said coarse mesh filter element until a predetermined pressure differential between the inlet and the outlet is obtained and means for sensing fluid pressure differentials between said inlet and said outlet and activating a first warning indicator at a predetermined pressure differential and activating a second warning indicator at pressure differentials greater than said predetermined pressure differential.

4,038,190

FLUID FRACTIONATION APPARATUS AND METHOD OF MANUFACTURING THE SAME

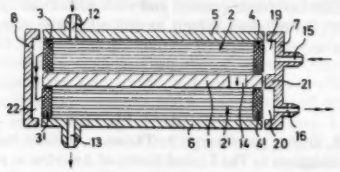
Jacques Baudet, Roussillon; Michel Rochet, Bron; Michel Salmon, Mions, and Bernard Vogt, Caluire, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 29, 1974, Ser. No. 474,426

Claims priority, application France, May 30, 1973, 73.19732

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **12 Claims**



1. A method for the continuous preparation of hollow fiber apparatus in which the fibers rest in a groove in a core, said method comprising the steps of:

a. fixedly positioning a core having a groove formed therein:

b. feeding into the groove of the core at least one bundle of hollow fibers fed from a plurality of bobbins, and maintaining the said bundle at its ends by gripping means, while moving the gripping means parallel to the axis of the groove with the bundle substantially from one end to the other of the core;

c. stopping the movement of the bundle gripping means when they are slightly past one end of the core after having entrained the bundle along the full length of the groove;

d. maintaining by other means the gripping of the bundle adjacent the other end of the groove;

e. forming fluidtight walls by joining the hollow fibers to themselves and to the ends of the core;

f. sectioning the hollow fibers between each end of the core and the means for clamping the bundle close to its ends;

g. loosening the ends of the bundle, by loosening the clamping means towards the end of the core opposite to that where the bundle has been fed to the groove;

h. lifting the core, the groove of which is filled with hollow fibers; and

i. repeating the steps (*a*) to (*h*) successively.

4,038,191

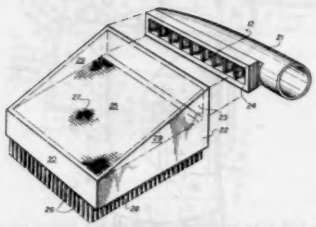
MANIFOLD FOR ULTRA FILTRATION MACHINE

Harold R. Davis; Christopher A. Brockley; Geoffrey V. Parkinson, all c/o Mechanical Engineering Dept., University of British Columbia, and John D. E. Price, c/o Faculty of Medicine, University of British Columbia all of Vancouver, British Columbia, Canada

Filed Oct. 14, 1975, Ser. No. 622,418

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **16 Claims**



1. A diffuser providing uniform diversion and diffusion with laminar flow, of liquid from a liquid supply tube having a given cross-section area to a liquid treatment face of a device in which said treatment face is of larger surface area than said supply tube;

said diffuser comprising a first diffuser section of tube continuous with the supply tube, flow turning vanes, and a second diffuser section leading to the liquid treatment face,

said first diffuser section having a cross-section which reduces smoothly and progressively as the liquid flow passage proceeds from an inlet of the first diffuser section to an end thereof, said first diffuser section being open on the side in a direction away from the curvature and supplying liquid in a direction perpendicular to the direction of liquid flow in the supply tube, to an inlet of the second diffuser section,

said second diffuser section comprising a compartment having a liquid flow space, the height of said compartment perpendicular to the treatment face diminishing continuously from an inlet of said diffuser to the distal side of the second diffuser section,

wherein a multiplicity of said flow turning vanes are associated with the interface between the first diffuser section tube and the second diffuser section compartment.

4,038,192

DEVICE FOR EXCHANGE BETWEEN FLUIDS SUITABLE FOR TREATMENT OF BLOOD

Juan Ricardo Serur, Brookline, Mass., assignor to International Biomedical Laboratories, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 421,420, Dec. 3, 1973, Pat. No. 3,894,954. This application July 14, 1975, Ser. No. 595,846

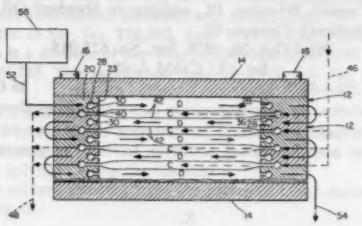
The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **12 Claims**

1. In a device for treating blood comprising blood flow paths defined by semi-permeable membrane walls and treatment fluid paths exposing the blood to the treatment fluid across said membrane walls, the improvement wherein the blood flow paths comprise a three dimensional array of narrow, elongated adjacent channels each defined by a pair of opposed membrane

panels supported at channel edges by linear support structure, and said treatment fluid paths extend through the array having



opposite sides along their length defined by and exposed to panels of different blood channels of said array.

4,038,193

METHOD AND DEVICE FOR SEPARATING LIQUIDS AND SOLIDS FROM A MIXTURE

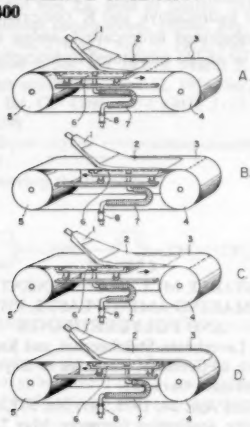
Jacob van Oosten, Maarssen, Netherlands, assignor to De Gooijer's Patent B.V., Rotterdam, Netherlands

Filed Nov. 24, 1972, Ser. No. 309,286

Claims priority, application Netherlands, Aug. 1, 1972, 7210541

Int. Cl.[2] B01D *33/04*

U.S. Cl. 210—400 **3 Claims**



1. A device for separating liquids and solid substances from a mixture, comprising:

a movable, endless filter belt driven by a driving roller and an adjustable driving gear;

a mixture supply nozzle positioned above the belt;

a suction box subjacent the belt and adapted to move parallel to the belt and communicating through a flexible duct with a vacuum device;

means for connecting the suction box alternately with the vacuum device or with atmosphere;

a pneumatic cylinder for displacing the suction box parallel to the belt, the pneumatic cylinder being coupled to the driving gear to selectively move the suction box and belt toghether and separately return the suction box;

the suction box comprising a plurality of relatively separate elements, each of the separate elements communicating through a separate flexible duct with a separate suction means communicating with the vacuum device, each suction means having a filtrate outlet;

said device further provided with distribution nozzles arranged at intervals above the belt along the direction of movement of the belt, the distribution nozzles being optionally connected by distribution means to at least one of the filtrate outlets and a supply of at least one washing liquor, whereby the filtrate from each element is kept separate and said solid substances on the belt can be washed with filtrate from at least one filtrate outlet and with at least one washing liquor.

4,038,194

BLOOD FILTER UNIT

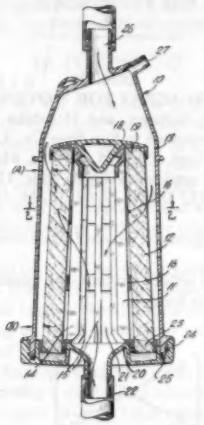
Alfred Robert Luceyk, Santa Paula; Herman Charles Mouwen, Ventura, both of Calif., and Steven Louis Weinberg, East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation of Ser. No. 462,454, April 19, 1974, abandoned.

This application Jan. 6, 1976, Ser. No. 646,775

Int. Cl.[2] B01D *27/00, 35/00*

U.S. Cl. 210—436 **7 Claims**



1. A unit for filtering blood comprising an assembly for supporting a filter cartridge, a filter cartridge, and a housing for said assembly and cartridge, said housing having a tapered cylindrical form with the smaller diameter end of said housing having an inlet for the blood to be filtered and an air vent, said housing and said assembly being fixedly securable to each other, said assembly for supporting a filter cartridge comprising a permeable cylindrical core, a top cap attached to one end of the core to seal said end, a bottom member attached to the opposite end of the core and extending outwardly from the periphery of the core leaving the center of the core open to act as the filter outlet, a filter cartridge comprising filter media extending between said top cap and said bottom member and about the circumference of said core, said media being sealed to the top cap and the bottom member, said core and said media in contact only at discrete, intermittent areas spaced longitudinally and circumferencially about the core and the distance between the housing and the filter media being uniformly increased from bottom member to the top cap and the area of the internal opening of the filter media being steadily increased from the top cap to the bottom member, whereby the uniformity of filter media utilization is increased.

4,038,195

FIRE FIGHTING COMPOSITIONS

Peter Jordan Chiesa, Jr., Coatesville, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 254,404, May 18, 1972, Pat. No. 3,849,315, Ser. No. 307,479, Nov. 17, 1972, abandoned, Ser. No. 369,584, June 13, 1973, Pat. No. 3,957,657, and Ser. No. 434,544, Jan. 18, 1974, abandoned, said Ser. No. 254,404, Ser. No. 307,479, and Ser. No. 369,584, each is a continuation-in-part of Ser. No. 131,763, April 6, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,175

Int. Cl.[2] A62D *1/00*

U.S. Cl. 252—3 6 Claims

1. In an aqueous foam type fire-fighting composition containing a surfactant with a fluorocarbon radical, which surfactant helps form an aqueous film over the surface of a burning hydrocarbon onto which the composition is applied, the improvement according to which (a) said surfactant is by itself unsuited for use with sea water, its hydrophile moiety is an aminocarboxylic acid structure linked to a perfluoroalkyl by a chain of 3 to 6 atoms, and it has a stable essentially linear structure which with the exception of the carboxyl contains not more than two branches each in the form of a substituent no larger than methyl, and (b) the composition is rendered suitable for foaming in sea water by at least one foamability-improving surfactant suitable for such use, at least 40% of the foamability-improving surfactant having a lyophilic hydrocarbyl group with from 6 to 10 carbons.

4,038,196

SOFTENING AGENT FOR WOVEN FABRICS

Yutaka Minegishi, Saitama, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1975, Ser. No. 616,621

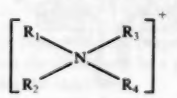
Claims priority, application Japan, Mar. 12, 1975, 50-29768

Int. Cl.[2] D06M *11/04, 13/36, 13/46*

U.S. Cl. 252—8.8 3 Claims

1. A softening agent for woven fabrics consisting essentially of

A. from 3 to 20 weight percent of a quaternary ammonium salt having the formula



wherein R_1 and R_2 each is alkyl having 12 to 20 carbon atoms or β-hydroxyalkyl having 14 to 22 carbon atoms; R_3 and R_4 each is alkyl or hydroxyalkyl having 1 to 3 carbon atoms, benzyl or $-(C_2H_4O)_nH$, wherein n is an integer of from one to 3; and X is halogen or alkyl sulfate in which alkyl has from one to 3 carbon atoms;

B. from 0.2 to 5 weight percent of polyoxyethyleneoleyl ether containing an average of from 8 to 200 moles of ethylene oxide;

C. from 0.5 to 10 weight percent of urea, and

D. from 0.08 to 2 weight percent of a water-soluble ammonium salt selected from the group consisting of the ammonia, monoethanolamine, diethanolamine and triethanolamine salts of mineral acids and carboxylic acids having one to 3 carbon atoms, and

E. and the balance consists essentially of water, with the proviso that the weight ratios of A, B, C and D are as follows:

B/A = 0.06 to 0.7
C/A = 0.1 to 1.3, and
D/A = 0.025 to 0.17.

4,038,197

S-TRIAZINE DERIVATIVES AS MULTI-FUNCTIONAL ADDITIVES FOR LUBRICATING OILS

Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 625,015

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—46.7 26 Claims

1. A lubricating oil composition containing from about 0.01 weight percent to about 5 weight percent of one or more oil-soluble multifunctional additives having the general formula

where

X_1 is —S—CS—OR, —S—CS—NR_2, —S—PS—$(OR)_2$, or —O—P—$(OR)_2$ and X_2 and X_3 are chlorine, bromine, —S—CS—OR, —S—CS—NR_2, —S—PS—$(OR)_2$, —O—P—$(OR)_2$, —HN—R′; or

where R comprises hydrocarbyl, chlorine substituted hydrocarbyl, bromine substituted hydrocarbyl or hydroxyl substituted hydrocarbyl; and R′ comprises hydrocarbyl, hydroxy-substituted hydrocarbyl, amino substituted hydrocarbyl or amido substituted hydrocarbyl.

4,038,198

STORAGE STABLE MULTICOMPONENT MIXTURES USEFUL IN MAKING AMINOPLASTS, PHENOPLASTS, AND POLYURETHANES

Kuno Wagner, Leverkusen-Steinbuechel, and Karlheinz Andres, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 24, 1975, Ser. No. 571,133

Claims priority, application Germany, May 7, 1974, 2421987

Int. Cl.[2] C08G *18/30, 18/34, 18/38;* C09K *3/00*

U.S. Cl. 252—182 13 Claims

1. Low viscosity storable multicomponent mixtures comprising:

a. at least one lactam-type compound,

b. at least one acid group-free material, selected from the group consisting of:

i. water

ii. difunctional organic compounds containing functional groups selected from the group consisting of hydroxyl, primary amino, secondary amino and sulfhydryl, and

iii. mixtures thereof,

c. at least one organic or inorganic acid selected from the group consisting of:

i. mono or polycarboxylic acid,

ii. organic and inorganic acids of phosphorus

iii. inorganic acids of boron, and

iv. partially hydrolyzed antimonous and antimonic acid esters of polyhydroxyl compounds with molecular weights of from 62 to 600,

wherein from 0.5 to 8 mols of component (*b*) and from 0.5 to 10 mols of component (c) are present per mol of component (a).

4,038,199

LYOTROPIC NEMATIC LIQUID CRYSTALS FOR USE IN ELECTRO-OPTICAL DISPLAY DEVICES

Derick Jones, and Sun Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 278,302, Aug. 7, 1972, Pat. No. 3,965,030, which is a division of Ser. No. 16,078, March 3, 1970, Pat. No. 3,690,745. This application June 22, 1976, Ser. No. 698,629

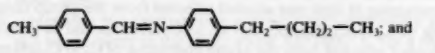
Int. Cl.[2] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 6 Claims

1. A mixed liquid crystal composition consisting essentially of a mixture of

a. a solvent having the formula

b. a solvent selected from the group of compounds consisting of



1. 4,4′-bis(heptyloxy)azoxybenzene,
2. 4,4′-bis(pentyloxy)azoxybenzene,
3. 4,4′-bis(hexyloxy)azoxybenzene,
4. 4,4′-dibutoxyazoxybenzene, and
5. 4,4′-dipropoxyazoxybenzene.

4,038,200

LYOTROPIC NEMATIC LIQUID CRYSTALS FOR USE IN ELECTRO-OPTICAL DISPLAY DEVICES

Derick Jones, and Sun Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

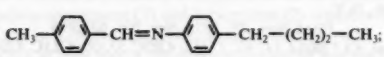
Division of Ser. No. 278,302, Aug. 7, 1972, Pat. No. 3,965,030, which is a division of Ser. No. 16,078, March 3, 1970, Pat. No. 3,690,745. This application June 22, 1976, Ser. No. 698,628

Int. Cl.[2] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 4 Claims

1. A mixed liquid crystal composition consisting essentially of a mixture of

a. a solvent having the formula



and

b. a solute selected from the group of compounds consisting of

1. p-ethoxyphenylazo phenyl heptanoate
2. p-(p-ethoxyphenylazo) phenyl undecylenate, and
3. p-(p-ethoxyphenylazo) phenyl hexanoate.

4,038,201

POLYCRYSTALLINE BODIES AND MEANS FOR PRODUCING THEM

Walter A. Hargreaves, West Brookfield, Mass., assignor to Optovac, Inc., North Brookfield, Mass.

Filed Mar. 24, 1972, Ser. No. 237,706

Int. Cl.[2] F21V *9/00;* G02B *5/20;* G02C *7/10*

U.S. Cl. 252—300 17 Claims

1. A method for producing a polycrystalline material of high optical quality having a grain growth size in the range of about 0.10 to about 10.0 millimeters from a batch of crystalline metal halide material which comprises

heating said batch sufficiently to convert said batch to a homogeneous noncrystallized molten mass

thereafter cooling the mass to a temperature which is within the polynucleation temperature range of the mass, the polynucleation temperature range of a substance being defined as the temperature range below the melting point of the substance at which a rapid uniform removal of heat results in the formation of numerous nucleation or independent crystallization centers which form without substantial growth at the expense of other crystals, by removing heat in predetermined directions of outflow therefrom, at a removal rate which is substantially equal in each direction of outflow

thereby to

initiate freezing of said mass as a plurality of individual crystals each of which cohere with others of said crystals in random crystal orientation, and induce substantially uniform contraction of the frozen material in directions in correspondence to the directions of heat outflow,

the heat removal being effected

at a controlled rate to maintain sufficient of said batch of material molten to flow into any voids produced in the frozen portion by contraction of the same, and

through said frozen portion at a rate which is at least substantially equal to the rate of liberation of latent heat of fusion and specific heat from the remaining molten material as the latter freezes, and

continuing heat removal at said rate until said mass is completely frozen into a solid polycrystalline material.

4,038,202

PROCESS FOR ELUTION OF ACTINIDE METAL MICROSPHERES

Otakar Votocek, Arnhem, Netherlands, assignor to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Continuation-in-part of Ser. No. 284,063 Aug. 28, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,225

Claims priority, application Netherlands, Aug. 26, 1971, 7111737

Int. Cl.[2] G21C *3/62*

U.S. Cl. 252—301.1 S 10 Claims

1. In a process for the preparation of microspheres of an actinide metal oxide or actinide metal salt including dispersing an aqueous metal oxide or salt phase, or an aqueous metal oxide phase additionally containing carbon, onto an immiscible organic liquid under conditions such that the dispersed droplets are solidified into solid microspheres and separating the thus produced solid microspheres with some organic liquid adhering thereto,

the improvement of removing said organic liquid from said microspheres comprising, in combination

1. providing said organic liquid with a lipophilic surfactant therein having an HLB value from about 7 to less than about 10.0 and
2. washing the thus separated microspheres with an aqueous solution containing a solubilizing amount of a hydrophilic surface active agent having a HLB value of at least 10.0 up to about 14.

4,038,203

CERTAIN ALKALI METAL-RARE EARTH METAPHOSPHATE PHOTOLUMINESCENT GLASSES

Tatsuo Takahashi, Isehara, Japan, assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,671

Int. Cl.[2] C09K *11/46;* C03C *3/16*

U.S. Cl. 252—301.4 P 8 Claims

1. A photoluminescent glass having the composition:

$$[n\{(1-x)M_2O2\times QP_2O_5\}][(1-y)Y_2O_3yR_2O_33P_2O_5]$$

wherein n is from 2 to 6; x is from 0 to 0.2 and y is from 0 to 1; and

M is an alkali metal,

Q is a thallium or silver activator selected from the group consisting of chlorides, oxides and nitrates of thallium and silver,

R is at least one of the group consisting of europium and terbium; and

wherein Q or R are present in said composition in amounts

effective to achieve photoluminescence when said glass is subjected to excitation by ultraviolet light.

4,038,204

ALKALINE-EARTH METAL HALOPHOSPHATE LUMINESCENT COMPOSITION ACTIVATED BY DIVALENT EUROPIUM AND METHOD OF PREPARING SAME

Anselm Wachtel, Parlin, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 3, 1968, Ser. No. 726,464
Int. Cl.[2] C09K 11/46
U.S. Cl. 252—301.4 P 18 Claims

1. A luminescent composition consisting essentially of a matrix of halophosphate of alkaline-earth metal, wherein the halogen if of the group consisting of fluorine, chlorine, bromine, and mixtures thereof, and an activating proportion of divalent europium.

4,038,205

METHOD FOR PRODUCING CADMIUM FREE GREEN EMITTING CATHODOLUMINESCENT PHOSPHOR

Henry B. Minnier, Dushore, and H. David Layman, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 509,928, Sept. 27, 1974, abandoned. This application July 6, 1976, Ser. No. 702,624
Int. Cl.[2] C09K 11/30
U.S. Cl. 252—301.6 S 3 Claims

1. Process for producing a green emitting cathodoluminescent phosphor consisting essentially of zinc sulfide activated by from 10 to 200 parts per million of copper and coactivated by from 20 to 600 parts per million of aluminum and containing less than 50 parts per million of halogen, the phosphor characterized by a cathodoluminescent emission having x and y coordinate values within the range of 0.250 to 0.280 and 0.560 to 0.6150, respectively, the process comprising:

a. firing a powder mixture of zinc sulfide, a copper compound and an aluminum compound at a temperature of about 950° to 1010° C for about 1 minute to 2 hours in a non-oxidizing atmosphere,

b. cooling the phosphor from the firing temperature at the rate of about 2° C per minute up to about 30° C per minute down to a temperature within the range of about 760° C to 870° C, in a nonoxidizing atmosphere, and

c. cooling the phosphor from a temperature within the range of about 760° C to 870° C at the rate of at least 50° C per minute down to a temperature below about 40° C.

4,038,206

HYDROXYALKYL LOCUST BEAN/XANTHOMONAS HYDROPHILIC COLLOID BLENDS

Curtis Lee Karl, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jan. 15, 1976, Ser. No. 649,306
Int. Cl.[2] B01J 13/00
U.S. Cl. 252—316 6 Claims

1. A thickener blend comprising about 5% to 70% xanthomonas gum by weight of the thickener blend and about 95% to 30% hydroxyethyl ether of locust bean gum having a molar ratio of substitution of about 0.05 to 0.05 moles of ethylene oxide to one mole of locust bean gum.

4. A thickener blend comprising about 5% to 70% xanthomonas gum by weight of the thickener blend and about 95% to 30% hydroxypropyl ether of locust bean gum having a molar ratio of substitution of about 0.05 to 0.50 moles of propylene oxide to one mole of locust bean gum.

4,038,207

STABILIZED HYDROCARBON GELS AND A METHOD FOR THEIR PREPARATION

Erwin Sigmund Poklacki, Arlington Heights, and Reinis Kalnajs, Chicago, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 3, 1975, Ser. No. 628,271
Int. Cl.[2] B01J 13/00; F17D 1/16
U.S. Cl. 252—316 3 Claims

3. A gelled hydrocarbon composition comprising a liquid hydrocarbon, from 0.2 to 10 percent by weight based on hydrocarbon of a gelling agent consisting of the pseudo double salt of an alkyl acid orthophosphate, said alkyl acid orthophosphate consisting of the mixture of monoalkyl diacid orthophosphates and dialkyl monoacid orthophosphates obtained by reacting phosphorus pentoxide with a mixture of alcohols containing at least one alcohol selected from the group consisting of C_1 to C_5 alkanols and C_1 to C_5 alkenols and at least one alcohol selected from the group consisting of C_6 to C_{22} alkanols and C_6 to C_{22} alkenols, with from 20 percent to about 70 percent of a stoichiometric amount of aluminum and a second cation selected from the group consisting of alkali metals, alkaline earth metals and ammonia, and from 5 to 200 percent by weight, based on gelling agent, of a carboxylic anhydride selected from the group consisting of the anhydrides of C_2 to C_{10} carboxylic acids and the anhydrides of C_2 to C_{10} dicarboxylic acids.

4,038,208

PROCESSES FOR REGENERATING DISPERSIONS OF LIGAND-STABILIZED, PALLADIUM(II) HALIDE COMPLEXES USED IN CARBONYLATION CATALYSTS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 635,994
Int. Cl.[2] B01J 31/40, 27/32; C07C 51/00; C11C 3/02
U.S. Cl. 252—412 3 Claims

1. A process for regenerating spent palladium carbonylation catalysts consisting of dispersions of ligand-stabilized palladium(II) halide catalyst complexes in quaternary ammonium, phosphonium, and arsonium salts of trihalostannate(II) and trihalogermanate(II), the spent catalyst being obtained from the carbonylation of olefins, said ligand-stabilixed catalysts being selected from the group consisting of:

$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$
$[ClCH_2(C_6H_5)_3P][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(n\text{-}C_4H_9)_4N][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$(C_6H_5)_4As][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][GeCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2$, and
$[(C_7H_{15})_4N][GeCl_3]$-$PdCl_2[As(C_6H_5)_3]_2$,

by the steps of:

a. Contacting said spent catalyst with an aqueous solution of hydrogen peroxide at 20° to 150° C in the mole ratio of 1–10^4 mole of peroxide per gram atom of palladium present in said catalyst.

b. Adding additional stabilizing ligand to the solid catalyst in the mole ratio of 1–10 mole of ligand per gram atom of palladium present, said stabilizing ligand being selected from the group consisting of triphenylphosphine, triphenylarsine, tri-p-tolylphosphine and tri-p-methoxyphenylphosphine, until the spent palladium carbonylation catalyst is regenerated.

4,038,209

CATALYST REGENERATION PROCESS

Richard J. Schoofs, Moraga, Calif., assignor to Catco Venture, Moraga, Calif.

Filed May 10, 1976, Ser. No. 684,471
Int. Cl.[2] B01J *37/12, 37/00*
U.S. Cl. 252—419 5 Claims

1. In a process for reactivating catalysts which have become inactive due to deposition of from about 3 to 20% of carbonaceous deposits on their surfaces by contacting the catalyst with a free oxygen-containing gas at elevated temperature to burn off the carbonaceous deposits, the improvement which comprises:

a. covering the catalyst with liquid water and maintaining the liquid water in contact with the catalyst for a least one hour, then

b. contacting the catalyst with a free oxygen-containing gas at a temperature in the range about 300°–600° F. for a time sufficient to evaporate substantially all of the water from the catalyst and concurrently remove a portion of the carbonaceous deposits, and

c. thereafter contacting the dried catalyst with a free oxygen-containing gas at a temperature in the range about 600°–900° F. to burn the remaining carbonaceous deposits.

4,038,210

BETA-AMINO NITRILE CATALYSTS FOR POLYURETHANE PREPARATION

Walter Richard Rosemund, Englewood, N.J.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 369,556, June 13, 1973, Pat. No. 3,925,268, which is a continuation-in-part of Ser. No. 353,512, April 23, 1973, abandoned. This application July 17, 1975, Ser. No. 596,628
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—426 4 Claims

1. A catalyst combination for polyurethane formation which comprises component (1) and component (2) wherein component (1) is 3-(N,N-dimethylamino)propionitrile, and component (2) is at least one of dimethylethanolamine and bis[2-(N,N-dimethylamino)ethyl]ether and wherein:

i. when component (2) is dimethylethanolamine, the said dimethylethanolamine is present in an amount of at least one and not more than 50 weight percent, based on the weight of component (1) and dimethylethanolamine; and

ii. when component (2) is bis[2-(N,N-dimethylamino)ethyl]ether, said bis-ether is present in an amount of at least one and not more than 25 weight percent, based on the combined weight of component (1) and said bis-ether.

4,038,211

OLEFIN HYDRATION CATALYST

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,437, Dec. 17, 1973, Pat. No. 3,917,721. This application July 9, 1975, Ser. No. 594,424
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—435 8 Claims

1. A process for preparing the olefin hydration catalyst which comprises employing an intermediate density silica xerogel characterized by having a particle size passing through 3 mesh and retained on 20 mesh, a bulk density of 0.38–0.48 g/cc, a pore volume of 0.80–2.2 ml/g with most of said volume contributed by micropores, and a BET surface area of 200–500 m^2/g; contacting said xerogel with water vapor or a mixture of water vapor and an inert gas diluent at a total pressure of 20–1500 psig, a relative humidity of about 30%–100%, and a temperature above 100° C. and less than 200° C.; and impregnating said xerogel with H_3PO_4.

4,038,212

ALKYLATION PROCESS FOR PRODUCTION OF MOTOR FUELS

James W. Brockington, and Richard H. Bennett, both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 561,401, March 24, 1975, Pat. No. 3,970,721. This application Mar. 19, 1976, Ser. No. 668,336
Int. Cl.[2] B01J *27/02*
U.S. Cl. 252—436 1 Claim

1. An alkylation catalyst consisting essentially of a mixture of CF_3SO_3H and H_2SO_4, in a weight ratio of about 0.166/1 respectively, and containing 0–3 weight percent weight and about 0–10 weight percent acid oils.

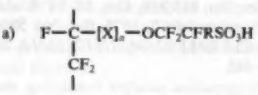
4,038,213

HYDROCARBON CONVERSION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

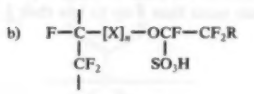
James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 4, 1976, Ser. No. 663,956
Int. Cl.[2] B01J *27/12*
U.S. Cl. 252—430 8 Claims

1. A catalyst composition comprising a solid perfluorinated polymer catalyst support on an inert porous carrier having an average pore diameter of between about 50 A and about 600 A in a weight ratio of catalyst to support of between about 0.1:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:

a) 

or

b) 

where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoralkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where m is an integer from 2 to 10 and Y is a radical selected from the class containing of fluorine and the trifluoromethyl radical.

4,038,214

IMPREGNATED FIBROUS CATALYST FOR TREATING EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE AND PROCESS FOR MAKING SAME

Sotoji Gotoh, Yokosuka; Jun Nakamura, Tokyo; Yuji Abe, and Tadashige Matsuo, both of Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 546,625, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 310,009, Nov. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 68,004, Aug. 28, 1970, abandoned. This application July 22, 1976, Ser. No. 707,507
Claims priority, application Japan, Aug. 28, 1969, 44-68141
Int. Cl.[2] B01J *23/86, 23/84, 35/06*
U.S. Cl. 252—458 5 Claims

1. A catalyst, for treating the exhaust gas of an internal combustion engine, prepared by the process which comprises:

a. preparing a carrier in the form of a flexible reticular fabric sheet consisting of spun yarn of 2000 – 10,000 glass filaments, of about 3 – 40 microns diameter, acid leached to remove solubles and to produce filaments of at least 95% purity silica, with the filaments having a heat resistance up to 1200° – 1300° C and the carrier sheet having a mesh in the range of 3.5 – 32 of the Tyler standard sieve;

b. forming a reaction solution consisting of cobalt chromate, by mixing a water-soluble organic acid salt of cobalt with a material selected from the group consisting of chromium trioxide and chromic acid, and with propylene alcohol by blending and stirring for 0.5 – 1.0 hour, to carry out an esterification reaction;

c. impregnating said carrier sheet with the obtained reaction solution and thereafter subjecting the impregnated carrier sheet to drying at 200° – 250° C for 0.5 – 1.0 hour;

d. calcining the impregnated and dried carrier sheet at 700° – 850° C for 0.5 – 1.0 hour; and

e. thereafter heat treating the catalyst at 800° C for substantially 3 hours in a reducing gas atmosphere containing hydrogen to activate the catalyst.

4,038,215

DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 7, 1975, Ser. No. 593,727

Int. Cl.[2] B01J *21/04, 21/10, 23/14, 23/26*

U.S. Cl. 252—465 **3 Claims**

1. A dehydrogenation catalyst consisting essentially of (1) magnesium chromite tin oxide, (2) magnesium chromite + tin oxide + aluminum oxide, or (3) $MgAl_xCr_{2-x}O_4$ + tin oxide wherein the ratio of Al:Cr is from 0.0004 to 1.2:1 and x is a number of from more than 0 up to less than 1.

4,038,216

MATERIAL AND METHOD OF MAKING SECONDARY-ELECTRON EMITTERS

Victor E. Henrich, Newton, and John C. C. Fan, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 482,109, June 24, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,390

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—514 **7 Claims**

1. A fine-grain layer of material comprising a mixture at least 50 vol % of grains of the high-yield secondary-electron emitting material MgO and grains of an electrically conductive material selected from the group consisting of Au, Ag and Pt,

the composition of said layer having a greater ratio of said emitting material to said conductive material at the surface of the layer than in the bulk of the layer,

the size of the grains of the emitting material is less than 200A and the conducting material of average size of 50–100 A are small enough to allow charge to tunnel from the surface of the grains of emitting material to the surrounding grains of conductive material and the grains of emitting material are large enough so that the emitting material has secondary-electron-emission characteristics close to that of the emitting material in the bulk.

4,038,217

CERAMICS HAVING NON-LINEAR VOLTAGE CHARACTERISTICS AND METHOD OF PRODUCING THE SAME

Masaharu Namba; Ikuo Nagasawa, and Kazuo Mukae, all of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Filed July 24, 1975, Ser. No. 598,956

Claims priority, application Japan, July 25, 1974, 49-85425; July 25, 1974, 49-85426; July 25, 1974, 49-85427

Int. Cl.[2] H01C *1/06;* **H01B** *1/08*

U.S. Cl. 252—521 **9 Claims**

1. A ceramic having non-linear voltage characteristics consisting essentially of the calcined product obtained on calcining in air a mixture of (a) zinc oxide, as a principal component, and (b) (1) cobalt and (2) one of neodymium, samarium or dysprosium, either in an elemental form or as a compound thereof, each in an amount of 0.1 to 10 atomic % for the cobalt, neodymium, samarium and dysprosium, calculated as cobalt, neodymium, samarium, and dysprosium, respectively, as subcomponents.

4,038,218

PROCESS FOR PREPARATION OF POWDERY DETERGENT COMPOSITIONS

Takashi Fujino, Yokohama; Makoto Yamanaka, Koganei, and Kouichi Yagi, Tokyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

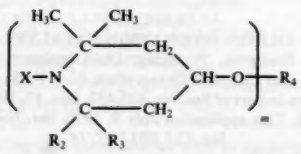
Filed Mar. 31, 1976, Ser. No. 672,472

Claims priority, application Japan, Apr. 14, 1975, 50-45063

Int. Cl.[2] C11D *1/14, 1/72, 3/28*

U.S. Cl. 252—542 **9 Claims**

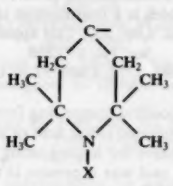
1. In a process which comprises spray drying an aqueous slurry of a detergent composition to obtain a powder detergent, wherein said detergent composition consists essentially of from 2 to 30 percent by weight of surfactant selected from the group consisting of surfactants having the formula $R_1—O—(CH_2CH_2O)_nH$, surfactants having the formula $R_1—O—(CH_2CH_20)_nSO_3M$, and mixtures thereof, wherein R_1 is alkyl having 6 to 24 carbon atoms or alkyl (C_6 to C_{18}) phenyl, n is a number from one to 29, and M is hydrogen, alkali metal or alkaline earth metal, and the balance of the detergent composition is other conventional ingredients for clothes laundering detergent compositions, the improvement which comprises the step of: incorporating in said aqueous slurry during the spray drying step from 0.05 to 10 parts by weight, per 100 parts by weight of said surfactant, of a smoke-preventing agent of the following formula



wherein X is hydrogen or oxygen; m is an integer of one to 3; R_2 and R_3, which can be the same or different, are alkyls having one to 12 carbon atoms, or

is cycloalkylidene having 5 to 7 carbon atoms, or

has the formula

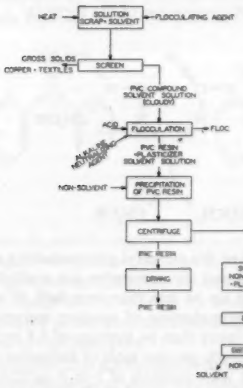


wherein X has the same meaning as defined above, in which; when *m* is one, R_4 is acyl, N-substituted carbamoyl, N-substituted thiocarbamoyl, alkyl, cycloalkyl, aralkyl, aryl, 2,2,6,6-tetramethyl-4-piperidyl and monovalent radical obtained by removal of one OH group from an acid selected from the group consisting of benzenesulfinic acid, benzenesulfonic acid, p-toluenesulfonic acid, p-n-dodecybenzenesulfonic acid, methanesulfonic acid, boric acid and phosphoric acid; when *m* is 2, R_4 is diacyl, alkylene, p-phenylene, p-xylylene, dicarbamoyl and divalent radical obtained by removing two OH groups from an acid selected from the group consisting of benzene-1,3-disulfonic acid, boric acid and phenylphosphorous acid; and when *m* is 3, R_4 is triacyl, tricarbamoyl, tristhio carbamoyl, propan-1,3,5-yl, hexan-1,3,6-yl, benzen-1,3,5-yl, benzene-1,3,5-triethylene and trivalent radical obtained by removing 3 OH groups from an acid selected from the group consisting of trisulfonic acid, boric acid, phosphoric acid and phosphorous acid; and when X is hydrogen, a salt thereof with phosphoric acid, carbonic acid, citric acid, stearic acid or benzoic acid.

4,038,219
RECLAMATION PROCESSING OF POLYVINYL CHLORIDE-SCRAP MATERIALS AND PRODUCTS PRODUCED THEREBY

Vicky Williams Boehm, Atlanta, and Barret Broyde, Decatur, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,470
Int. Cl.[2] C08J *11/02, 11/04*
U.S. Cl. 260—2.3 **11 Claims**



1. A method of recovering a reusable essentially pure vinyl chloride polymer resin from a scrap polymer mixture which comprises plasticized polyvinyl chloride and insoluble additives, which includes the steps of:

contacting a polymer mixture which comprises plasticized polyvinyl chloride and insoluble additives with a solvent for vinyl chloride polymers to form a solvent mixture comprising a solvent solution of dissolved vinyl chloride polymer and plasticizers and other insoluble additives;

treating the solvent mixture with an acid which is selected from the group consisting of an inorganic acid and an inorganic acid solution and which is substantially soluble in the solvent in the presence of a flocculating agent which is selected from the group consisting of liquid monomeric esters, polystyrene, polyethyl methacrylate, poly (vinyl isobutyl ether), polyvinyl acetate and ethylene vinyl acetate to flocculate and remove the suspended additives; and

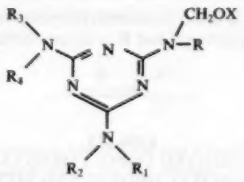
treating the solvent solution with a non-solvent which is miscible with the solvent in substantially all proportions and which is a solvent for the plasticizer to precipitate an essentially pure vinyl chloride polymer resin therefrom.

4,038,220
METHOD FOR ADHESION OF RUBBER [USING N-(SUBSTITUTED OXYMETHYL)MELAMINES AND BETA NAPHTHOL] TO REINFORCING MATERIALS

Harold Godfred Thompson, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 496,245, Aug. 9, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,479
Int. Cl.[2] C08L *7/00, 9/00;* **C09J** *3/14*
U.S. Cl. 260—3 **8 Claims**

1. A vulcanizable rubber composition comprising rubber, a vulcanizing agent, from about 1 to 10 parts per 100 parts of the rubber of an N-(substituted oxymethyl)melamine having the following general formula



wherein X is hydrogen or lower alkyl having 1 to 8 carbon atoms; R, R_1, R_2, R_3 and R_4 are individually hydrogen, lower alkyl having from 1 to 8 carbon atoms or the group $—CH_2OX$, wherein X is as defined above, and from about 0.5 to 8 parts per 100 parts of rubber of at least one of alpha or beta naphthol, said rubber composition when vulcanized, having good adhesion to textile fiber or metal reinforcing cords embedded therein.

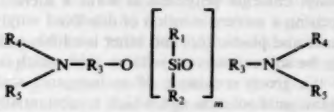
4,038,221
PROCESS FOR THE PRODUCTION OF COLD HARDENING FOAMS CONTAINING URETHANE GROUPS BY IN-MOLD FOAMING

Johan Bernhard Koster, Stuerzelberg; Hans Joachim Meiners, Leverkusen-Schlebusch, and Hans Heinrich Moretto, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 17, 1975, Ser. No. 632,422
Claims priority, application Germany, Nov. 20, 1974, 2454054
Int. Cl.[2] C08J *9/00*
U.S. Cl. 260—2.5 AH **9 Claims**

1. A process for the production of cold-hardening non-shrinking open-pored foams containing urethane groups by foaming in a mold a mixture comprising A) a polyether having at least two hydroxyl groups and a molecular weight in the

range from 750 to 100,000, B) a polyisocyanate, C) a blowing agent, D) a catalyst and E) a silicon compound wherein the silicon compound used corresponds to the general formula



in which

R_1 and R_2 represents a substituted or unsubstituted monovalent hydrocarbon group,

R_3 represents a C_2–C_{20} alkylene group,

R_4 and R_5 represent a substituted or unsubstituted monovalent hydrocarbon group, in addition to which R_4 and R_5 may together form an alkylene ring which may be interrupted by heteroatoms, and

m is an integer from 1 to 20.

4,038,222

UNTRIAKONTAPEPTIDE WITH OPIATE ACTIVITY

Choh Hao Li, Berkeley, Calif., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Mar. 17, 1976, Ser. No. 667,747
Int. Cl.[2] C08L 89/00; A61K 37/00; C07C 103/52
U.S. Cl. 260—8 7 Claims

1. A compound of the formula

Boc-Tyr(oBr-Z)-Gly-Gly-Phe-Met-Thr-Ser(Bzl)-Glu(OBzl)-Lys(oBr-Z)-Ser(Bzl)-Gln-Thr-Pro-Leu-Val-Thr-Leu-Phe-Lys(oBr-Z)-Asn-Ala-Ile Ile-Lys(oBr-Z)-Asn-Ala-His(Boc)-Lys(oBr-Z)-Lys(oBr-X)-Gly-Gln-R

wherein oBr-Z is ortho bromobenzyloxycarbonyl; Bzl is benzyl; Boc is toxycarbonyl and R is styrene-divinylbenzene copolymer resin.

4,038,223

NOVEL SEGMENTED COPOLYMERS CONTAINING FREE HYDROXYL GROUPS AND METHOD OF PREPARING THE SAME

Leila Pohjola, Veikkola; Olavi Harva, and Jaakko Karvinen, both of Helsinki, all of Finland, assignors to Neste Oy, Finland

Filed Sept. 30, 1975, Ser. No. 618,038
Int. Cl.[2] C08L 5/00
U.S. Cl. 260—9 13 Claims

1. A segmented copolymer containing free hydroxyl groups and comprising hard and soft segments, said hard segments comprising a polyhydroxy compound containing two primary hydroxyl groups and at least two secondary hydroxyl groups and being selected from the group consisting of disaccharides and sugar alcohols of the formula

$$HOCH_2(CHOH)_nCH_2OH$$

wherein n is a whole number from 2 to 5, and said soft segments comprising a compound of average molecular weight of from about 250 to about 5000 and being selected from the group consisting of low molecular weight polyesters having terminal isocyanate groups and low molecular weight polyethers having terminal isocyanate groups, and hard segments being linked at the primary hydroxy groups thereof to the isocyanate groups of said soft segments so that said segmented copolymer is substantially free of cross linking and contains free secondary hydroxyl groups.

4,038,224

ORGANICALLY MODIFIED SILICIC ACIDS AND SILICATES FOR DELUSTERING LACQUERS

Edith Eisenmenger, Offenbach (Main); Otto Kühnert, Beuel; Robert Kuhlmann, Keidenich; Peter Nauroth, Wesseling, and Günter Türk, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 567,203, April 11, 1975, abandoned, which is a continuation of Ser. No. 113,635, Feb. 8, 1971, abandoned, which is a continuation of Ser. No. 765,683, Oct. 7, 1968, Pat. No. 3,607,337. This application Apr. 5, 1976, Ser. No. 673,555
Int. Cl.[2] C08L 1/12; C08K 3/36; C09C 1/30
U.S. Cl. 260—15 R 4 Claims

1. A lacquer composition comprising from about 2 to 5% by weight of wax-impregnated silicic acid or silicate wherein said wax is the only additive for impregnating said silicic acid or silicate and wherein said wax is present in an amount of about 2 to 7% by weight of the wax impregnated 1 microns in size with a particle size distribution such that at least 28.4% by weight are less 2.3 microns at least 68% by weight are less than 3.5 microns and at least 97.7% by weight are less than 7.1 microns, whereby the wax impregnated silicic acid or silicate particles produces a delustered lacquer film smooth surface and of high scratch resistance.

4,038,225

THERMOSETTING HIGH SOLID COATING COMPOSITION

Yasuo Takaya; Tadashi Watanabe, and Naozumi Iwasawa, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

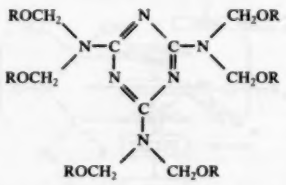
Filed June 2, 1975, Ser. No. 582,700
Claims priority, application Japan, June 6, 1974, 49-63416
Int. Cl.[2] C09D 3/52
U.S. Cl. 260—21 10 Claims

1. A thermosetting high solid coating composition usable for spray coating at a temperature below 70°C which comprises:

A. a mixture of:

a. 80 to 60 parts by weight of alkyd resin having a fatty acid content of 10 to 20% by weight and a phenyl group content of 10 to 25% by weight, and further the hydroxyl group equivalent and dibasic acid ratio (the molar ratio of dibasic acid/polyhydric alcohol) of said resin existing on or within the four sides of the tetragon as defined by four points of (300, 0.700), (300, 0.775), (500, 0.775) and (500, 0.8500 on a coordinate of said hydroxyl group equivalent as abscissa and said dibasic acid ratio as ordinate; and

b. 20 to 40 parts by weight of melamine resin comprising hexakisalkoxymethylmelamine of the formula:



in which 2 to 6 of R's are alkyl groups having each 2 to 4 carbon atoms and the remainder are methyl groups, and an amount up to less than one half of said hexakisalkoxymethylmelamine of another melamine resin containing not more than an average of 5.5 moles combined formaldehyde per one mole of melamine resin and being modified with alcohols of 1 to 4 carbon atoms;

B. 0.05 to 1.00 parts by weight of aliphatic or aromatic sulfonic acid or its amine salt per 100 parts of said mixture; and

C. 80 to 20 parts by weight of solvent per 100 parts by weight of said mixture, said solvent being able to dissolve simultaneously the components in said mixture.

4,038,226

METHOD AND COMPOSITION FOR SOLVENTLESS PRINTING

Jack Lewis Towle, and John Herman Vander Ploeg, both of Holland, Mich., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 22, 1975, Ser. No. 579,876
Int. Cl.[2] C08G 12/12, 12/32; C09D 11/10
U.S. Cl. 260—22 CQ 41 Claims

1. A method of polymerizing an amino resin precursor which comprises heating the precursor in the presence of a catalytic amount of at least one latent catalyst selected from the group consisting of ortho-toluenesulfonyl-ortho-tolylhydrazide, benzylsulfonylphenylhydrazide, benzenesulfonylphenylhydrazide, and para-toluenesulfonylphenylhydrazide to a curing temperature of from about the in situ decomposition temperature of the latent catalyst to about the decomposition temperature of the precursor.

4,038,227

PHOTODEGRADABLE POLYOLEFINS CONTAINING AN AROMATIC KETONE, FERRIC STEARATE, AND A PIGMENT

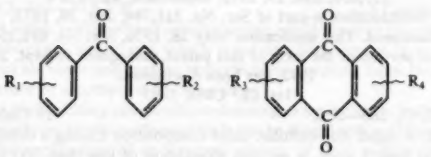
Carl E. Swanholm, and Robert G. Caldwell, both of Boise, Idaho, assignors to Bio-Degradable Plastics, Inc., Sioux Falls, S. Dak.

Continuation of Ser. No. 538,390, Jan. 3, 1975, abandoned, which is a division of Ser. No. 372,046, June 21, 1973, Pat. No. 3,888,804, which is a continuation-in-part of Ser. No. 195,021, Nov. 2, 1971, abandoned. This application Sept. 13, 1976, Ser. No. 722,744
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—23 H 9 Claims

1. Microbially consumable packaging materials comprising a predominance of the photodegradation products of

an aliphatic poly-α-olefin polymer;

a photosensitizing agent selected from the group of compounds represented by the general formulas



wherein R_1 and R_3 represent alkyl or alkoxyl groups containing at least four carbon atoms, and R_2 and R_4 represent hydrogen, halogen, alkyl or alkoxyl groups in the concentration range 0.01% to 0.5% by weight of the polymers;

ferric stearate in the concentration range 0.01% to 0.5% by weight of the polymers;

a color pigment that accelerates sensitized photodegradation in a concentration of about five percent by weight of the polymer;

oxygen; and

sunlight.

4,038,228

DEGRADABLE PLASTIC COMPOSITION CONTAINING A TRANSITION METAL SALT OF A HIGHLY UNSATURATED ORGANIC ACID

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 200,593, Nov. 19, 1971, abandoned. This application Sept. 20, 1976, Ser. No. 724,666
Int. Cl.[2] C08J 3/20
U.S. Cl. 260—23 AC 14 Claims

1. As a composition of matter, a plastic composition which is degradable in the absence of electromagnetic radiation and consisting essentially of an organic polymer having dispersed therein at least one transition-metal salt of at least one highly unsaturated organic acid.

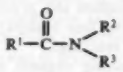
4,038,229

PROCESS FOR THE MANUFACTURE OF IMPREGNATING MELAMINE RESINS

Wolfgang Eisele; Ludwig Leigemann; Bernhard Magerkurth, all of Ludwigshafen, and Harro Petersen, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 353,484, April 23, 1973, abandoned. This application June 12, 1975, Ser. No. 586,424
Int. Cl.[2] C08L 61/28
U.S. Cl. 260—29.4 R 6 Claims

1. In a process for the manufacture of impregnating resins based on precondensates of melamine and formaldehyde, wherein melamine and formaldehyde are condensed at a molar ratio of melamine to formaldehyde of from 1:1.6 to 1:6 in aqueous solution, the improvement comprising the addition of a fatty acid dialkyl amide which is soluble in the aqueous impregnating resin solution and has the formula



where R^1 is hydrogen or lower alkyl and R^2 and R^3 are alkyl of from 1 to 4 carbon atoms, to the aqueous solution before, during or after condensation in an amount of from 1 to 20% by weight, based on the melamine/formaldehyde precondensate content of the aqueous solution.

4,038,230

AQUEOUS DISPERSION OF PARTICULATE SPHEROIDAL POLYTETRAFLUOROETHYLENE

Max B. Mueller, Morristown; Peter P. Salatiello, Morris Plains, and Dulari L. Sawhney, Highland Park, all of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Division of Ser. No. 91,046, Nov. 19, 1970, Pat. No. 3,752,796. This application Jan. 31, 1973, Ser. No. 328,226
Int. Cl.[2] C08L 27/18
U.S. Cl. 260—29.6 F 1 Claim

1. An aqueous dispersion of particulate polytetrafluoroethylene, said particulate polytetrafluoroethylene having a surface area of at least 9 sq.m./g., predominantly comprising spheroidal particles having an average particle diameter of greater than 0.35 micron, a narrow particle size distribution corresponding to a distribution function of less than 0.4, and a number average molecular weight of at least 2.0×10^6, said aqueous dispersion comprising more than 75% by weight of said particulate polytetrafluoroethylene.

4,038,231

PROCESS FOR AQUEOUS DISPERSION OF PERFLUOROALKYL- OR PERFLUOROALKOXY TRIFLUOROETHYLENE POLYMERS

John Michael Downer, Harpenden; William George Rodway, Welwyn, and Laurence Stanley John Shipp, Stevenage, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 30, 1974, Ser. No. 510,571

Claims priority, application United Kingdom, May 16, 1974, 21748/74

Int. Cl.[2] C08L *27/18*

U.S. Cl. 260—29.6 F 12 Claims

1. An aqueous dispersion of a tetrafluoroethylene polymer comprising colloidal particles containing at least 98% by weight of polymerised tetrafluoroethylene and polymerised therewith at least one copolymerisable monomer selected from perfluoroalkyl trifluoroethylenes and perfluoroalkoxy trifluorethylenes each having from 3 to 10 carbon atoms, said particles having inner core and outer shell portions in which the weight concentration of copolymerised monomer present in the outer shell portion (relative to the weight concentration of tetrafluoroethylene with which it is polymerised) is less than half that of the inner core portion, the weight ratio of the polymer forming the shell to the polymer forming the core being between 1:99 and 99:1.

4,038,232

ELECTRODEPOSITABLE COMPOSITIONS CONTAINING SULFONIUM RESINS AND CAPPED POLYISOCYANATES

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 316,596, Dec. 19, 1972, abandoned. This application July 8, 1975, Ser. No. 594,152

Int. Cl.[2] C08F *8/30, 8/34;* C08J *3/06;* C08L *13/00*

U.S. Cl. 260—29.6 TA 14 Claims

1. An aqueous based resinous dispersion suitable for use as a coating composition comprising as the resinous phase:

A. a quaternary sulfonium salt group solubilized synthetic organic resin coating free hydroxyl groups, said organic resin produced by reacting:

1. an epoxy-containing organic material having a 1,2-epoxy equivalency of greater than 1, and
2. a sulfide-acid mixture, said sulfide-acid mixture being used in an amount to provide sufficient quaternary sulfonium groups to solubilize said resin; said sulfide being selected from the group consisting of aliphatic, mixed aliphatic-aromatic, aralkyl and cyclic sulfides; and

B. a capped, organic polyisocyanate stable at ordinary room temperature in the presence of said resin (A) and reactive with said resin (A) at elevated temperatures.

4,038,233

AQUEOUS RESIN COMPOSITION CONTAINING POLYMERS OR COPOLYMERS OF ETHYLENICALLY UNSATURATED MONOMERS AND A WATER-SOLUBLE CATIONIC POLYELECTROLYTE POLYMER

Jay S. Shultz, Little Rock, Ark., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed July 11, 1975, Ser. No. 595,248

Int. Cl.[2] C08L *33/08*

U.S. Cl. 260—29.6 RW 7 Claims

1. An aqueous resin composition capable of being applied to porous materials under conditions of controlled migration thereon or penetration thereinto comprising:

1. 0.1 to 60% by weight on a solids basis of an anionically or non-ionically stabilized aqueous dispersion of synthetic resin solids selected from the group consisting of polymers and copolymers of ethylenically unsaturated monomers; and
2. 0.01 to 8% by weight, based on the weight of the synthetic resin of a water-soluble, cationic polyelectrolyte polymer having a molecular weight of at least 20,000 and having
   a. a backbone consisting essentially of carbon atoms and
   b. side chains containing amine groups, said mixture of synthetic resin solids and cationic polyelectrolyte polymer being stable and having a zeta potential which is slightly cationic, whereby when applied to porous materials having a slightly anionic zeta potential, the zeta potential of said composition approaches or reaches zero thereby destabilizing the composition and coagulating and thickening the same.

4,038,234

AQUEOUS DISPERSION OF FLUOROCARBON POLYMER AND HALOGEN-CONTAINING COMPLEX PHOSPHATE OF ALUMINUM

James Derek Birchall, Norley; John Edward Cassidy, Hartford, and Edward Henry Grice-Hutchinson, London, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 593,958, July 8, 1975, abandoned, which is a continuation of Ser. No. 459,699, April 10, 1974, abandoned, which is a continuation of Ser. No. 207,634, Dec. 13, 1971, abandoned. This application Aug. 11, 1976, Ser. No. 713,509

Claims priority, application United Kingdom, Dec. 11, 1970, 59008/70

Int. Cl.[2] C08L *27/18*

U.S. Cl. 260—29.6 F 15 Claims

1. A composition which consists essentially of a fluorocarbon polymer resin dispersed in an aqueous medium in which there has been dissolved a halogen-containing complex phosphate of aluminum, said complex being identifiable as containing a chemically-bound hydroxy compound R—OH wherein R is a hydrogen atom or an inert organic group, and wherein the ratio of elements is such as to form the said complex and wherein the ratio of the number of atoms of aluminum to the number of atoms of phosphorus in the complex is $1:x$ where x is no greater than 1.8 and the ratio of the number of atoms of aluminum to the number of atoms of halogen in the complex is from 1:0.1 to 1:5, and the weight ratio of aluminum to fluorocarbon polymer resin in the composition is from about 0.02:1 to about 0.25:1.

4,038,235

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 574,157, May 2, 1975, Pat. No. 3,983,063, which is a division of Ser. No. 405,244, Oct. 10, 1973, Pat. No. 4,001,166, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 28, 1976, Ser. No. 691,254

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.[2] C08K *5/45*

U.S. Cl. 260—30.2 11 Claims

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition, free of catalytic quantities of a catalyst for urethane formation, and comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of cyclic sulfones and mixtures thereof; and

wherein components (A) and (B) are present in quantities such

that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,038,236

RESOL TYPE VARNISHES CONTAINING TAR ACIDS

Joseph Gordon Robinson, Winchcombe, and Edward Aubrey Rogers, Worcester, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 23, 1975, Ser. No. 643,914
Claims priority, application United Kingdom, Jan. 15, 1975, 01708/75
Int. Cl.[2] C08G *14/06, 14/12, 14/14*
U.S. Cl. 260—32.8 R 14 Claims

1. A thermosetting resol-type resin prepared by reacting a blend of a tar acid and a resinous reaction product with formaldehyde in the presence of ammonia, wherein the resinous reaction product is prepared by reacting an oxygen-containing naphthalene-formaldehyde resin with a phenol.

4,038,237

FIRE RETARDANT WIRE COATING

John L. Snyder, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed June 17, 1976, Ser. No. 697,181
Int. Cl.[2] C08K *5/01, 5/02*
U.S. Cl. 260—33.6 AQ 8 Claims

1. A fire-resistant polymer composition comprising:
   a. 100 parts by weight of a block copolymer having at least two polymer end blocks A and at least one polymer mid block B, each block A being a non-elastomeric polyer a monoalkenyl arene having an average molecular weight of between about 2,000 and about 125,000 and having no more than 25% of the aromatic double bonds being reduced by hydrogenation, and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight between about 10,000 and about 250,000;
   b. 0–200 parts by weight of an extending oil;
   c. 10–300 parts by weight of a polymeric alpha-olefin;
   d. 5–100 parts by weight of antimony trioxide;
   e. 25–200 parts by weight of a chlorinated hydrocarbon; and
   f. 50–300 parts by weight of a calcium sulfate filler.

4,038,238

LOW DENSITY RAPID-SETTING POLYURETHANES

Thomas E. Cravens, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1973, Ser. No. 392,592
Int. Cl.[2] C08K *7/28*
U.S. Cl. 260—33.6 UB 2 Claims

1. A solid, polyurethane article having a bulk density of less than about 0.7 g/cm^3 and which is substantially free of large internal air voids and surface imperfections resulting from the admixture of a composition comprising
   A. a rapid-setting polyurethane-forming composition which produces a polyurethane which can be demolded, without the application of an external source of heat, within 5 minutes after admixture of the components of the polyurethane-forming composition,
   B. as a light weight filler component, hollow spheres or microballoons of a copolymer of vinylidene chloride, acrylonitrile and divinyl benzene in an amount to provide the polyurethane composition with a bulk density of less than about 0.7 g/cm^3, said spheres or microballoons having a density of from about 0.03 to about 0.45 grams/cc and a particle size of from about 10 to about 100 microns, and
   C. as a viscosity reducing component, a liquid aromatic or halogenated aromatic compound in a quantity sufficient to provide the mixture of Components (A), (B) and (C) with a viscosity of less than about 2000 centipoises at 25° C.

4,038,239

MOISTURE CURABLE POLYURETHANE SYSTEMS

Robert N. Coyner, Hopkins, and Peter Skujins, Minneapolis, both of Minn., assignors to ConTech Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 418,192, Nov. 23, 1973, Pat. No. 3,919,173. This application Aug. 19, 1975, Ser. No. 605,910
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.[2] C08G *18/70*
U.S. Cl. 260—33.6 UB 10 Claims

1. A process for making a one-part, moisture-reactive composition comprising a moisture-reactive isocyanate-terminated polyether-urethane prepolymer, said process comprising the steps of:
   a. providing an isocyanate-reactive composition comprising: an alkaline earth metal oxide, wherein the metal has an atomic weight ranging from 40 to 138, a catalyst for isocyanate/active hydrogen reations, and a liquid polyol composition having an average equivalent weight greater than 1000 and an average functionality greater than 2, said polyol containing at least one polyoxyalkylene chain; the amounts of alkaline earth metal oxide being greater than the stoichiometric amount for reacting with all the water in said isocyanate-reactive composition;
   b. exothermically reacting an aliphatic polyisocyanate, at least one of the free isocyanate radicals of said aliphatic polyisocyanate being substantially kinetically more reactive with respect to active hydrogen than any other said free isocyanate radicals;
   c. after at least 25% of said free isocyanate radicals of said aliphatic polyisocyanate have reacted with said isocyanate-reactive composition, exothermically reacting said isocyanate-reactive composition with an aromatic polyisocyanate, at least one of the free isocyanate radicals of said aromatic polyisocyanate being substantially kinetically more reactive with respect to active hydrogen than any other said free isocyanate radicals of said aromatic polyisocyanate, the amounts of polyisocyanate being controlled such that the ratio of aromatic NCO equivalents to aliphatic NCO equivalents reacted with said isocyanate-reactive composition is at least about 1:1 but less than 7:1 and the NCO/OH ratio for the entire moisture curable composition is greater than about 1.8:1 but no more than about 3:1; **whereby a moisture-reactive isocyanate-terminated polyurethane prepolymer composition having an average NCO functionality greater than** 1.8 but less than 3.0 is obtained as a result of steps (b) and (c), said isocyanate-terminated prepolymer composition, upon the addition of a curing catalyst for the isocyanate/water reaction, being curable under normal ambient conditions to a solid elastomer, which, in the form of a sheet-like article, has a tensile strength at break greater than 25 psi and an elongation at break greater than 200%;
   d. applying said moisture-reactive isocyanate-terminated polyurethane prepolymer composition to a substrate and curing said composition.

4,038,240

PROCESS FOR DYEING POLYURETHANE RESINS

Herbert Hugl, and Gerhard Wolfrum, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1975, Ser. No. 580,036
Claims priority, application Germany, May 29, 1974, 2426180
Int. Cl.[2] C08K *5/23*
U.S. Cl. 260—37 N 21 Claims

1. Process for dyeing polyurethane resins with dyes which are suitable for incorporation in the resin with the formation of covalent bonds, characterised in that dyes of formula:

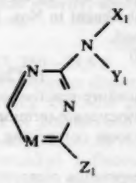
F — B — A

wherein:

F denotes the residue of a dye molecule which is free from reactive groups and from water solubilising groups,

B denotes a direct bond or a bridge member, and

A denotes the group:



wherein:

M represents N, CH or C—Hal,

Hal represents halogen,

Z_1 represents OZ_2 or

X_1 represents an optionally substituted ω-hydroxyalkyl group or ω-hydroxyalkenyl group,

X_2, Y_1 and Y_2 represent hydrogen or optionally substituted alkyl, alkenyl, aralkyl or aryl groups, or X_1 and Y_1 together with the nitrogen atom form a heterocyclic group, and

Z_2 represents an optionally substituted alkyl group with the proviso that at least one of the groups X_2, Y_1, Y_2 and Z_2 is an ω-hydroxyalkyl or alkenyl group,

are added to the reaction mixture or to one of the components before or during the polyaddition reaction.

4,038,241

POLYMER COMPOSITIONS CONTAINING A BISAZOMETHINE PIGMENT

Eric Richard Inman, Bridge of Weir; James McGeachie McCrae, Stewarton; Christopher Midcalf, Kilbarchan, and Alison Turner, Houston, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

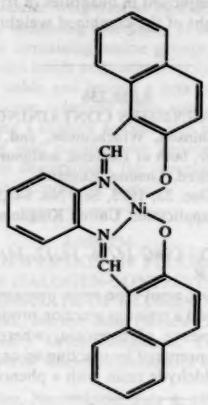
Division of Ser. No. 333,598, Feb. 20, 1973, Pat. No. 3,864,371. This application Nov. 22, 1974, Ser. No. 526,283

Claims priority, application United Kingdom, Feb. 24, 1972, 8517/72

Int. Cl.² C08K *5/35;* **C08L** *23/02, 25/06, 75/04*

U.S. Cl. 260—39 P **9 Claims**

1. A composition comprising a natural or synthetic polymer containing, as pigment, a compound of the formula



in the pigmentary form in which it has an orange-red color and has an X chromaticity co-ordinate of from 0.59 to 0.63 and a Y chromaticity of from 0.33 to 0.36.

4,038,242

SYNTHETIC SLATE

Melvin C. Kuehn, Grand Rapids, Minn., assignor to Ormite, Inc.

Filed May 12, 1975, Ser. No. 576,750

Int. Cl.² C08K *3/22*

U.S. Cl. 260—39 R **15 Claims**

1. A solid dense slate-like composition comprising a unitary product substantially having the physical properties of density and hardness of natural slate which is formed from a substantially uniform mixture of at least about 5 parts by weight of a finely divided taconite material of 35 mesh or less which contains at least about 1 percent magnetite therein, and about 1 part by weight of an amine-formaldehyde resin, said product being formed by heating under pressure the substantially uniform mixture of the taconite material and resin.

4,038,243

GLASS FIBER SIZING COMPOSITIONS FOR THE REINFORCEMENT OF RESIN MATRICES

John Maaghul, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 606,272, Aug. 20, 1975, which is a division of Ser. No. 512,646, Oct. 7, 1974, Pat. No. 3,936,285. This application Mar. 22, 1976, Ser. No. 668,754

Int. Cl.² C08K *3/40*

U.S. Cl. 260—40 R **2 Claims**

1. In the method of forming a molding compound comprising:

coating a nonadhering substrate with thickened polyester resin;

applying chopped glass fiber roving to said coated substrate;

coating a second nonadhering substrate with said polyester resin;

contacting the coatings on said substrates;

mixing the chopped glass fiber roving throughout the resin composition; and

collecting the composite so formed, the improvement comprising:

sizing on said glass fiber roving a composition comprising the dried residue of a sizing composition comprised of a water solubilized first unsaturated polyester resin, said polyester resin being substantially insoluble in aromatic solvents;

a second unsaturated polyester water insoluble resin, said second polyester resin being soluble in said first polyes-

ter resin and said second polyester resin preventing the migration of said sizing composition;
a plasticizer;
a first silane coupling agent having amino functionality to promote adhesion between said glass fibers and said resin composite;
a second silane coupling agent which is free radically polymerizable to control the wetting of said glass fibers by said first silane coupling agent;
and a thermoplastic polymer being of sufficiently low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition.

4,038,244

FLUOROCARBON POLYMER

Keith Ogden, Thornton-Cleveleys, and John Quinby, Northwich, both of England, assignors to Imperial Chemical Industries Limited, London, England

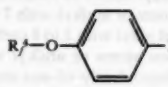
Filed Feb. 27, 1974, Ser. No. 446,505

Claims priority, application United Kingdom, Mar. 5, 1973, 48-10537

Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—42.16 **7 Claims**

1. A method of producing a filled coagulated dispersion form of a fluorocarbon polymer which method comprises
a. treating a filler with a hydrophobising agent which is an anionic surface active agent of the formula:-



where R_f is a perfluorocarbon group derived from a TFE oligomer, X is a an anionic group and K is a cationic group,
b. adding the treated filler to an aqueous dispersion of the fluorocarbon polymer, and
c. coagulating the polymer and filler together.

4,038,245

CHAR-FORMING POLYMER COMPOSITIONS

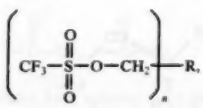
Charles E. Reineke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1976, Ser. No. 688,862

Int. Cl.[2] C08K *5/41*

U.S. Cl. 260—45.7 S **10 Claims**

1. A char-forming composition of matter comprising, (A) a polymeric component that comprises (1) polymerized ethylenically unsaturated carboxylic anhydride in an amount sufficient to provide at least about 1 milliequivalent of anhydride moiety per gram of the char-forming composition, and (2) polymerized monovinylidene aromatic monomer in an amount sufficient to provide at least about 1 milliequivalent of reactive aromatic moiety per gram of the char-forming composition, and (B) a char-forming amount of a stable ester of the formula:



wherein n is a positive integer and R is an n-valent tertiary hydrocarbyl radical or an inertly substituted n-valent tertiary hydrocarbyl radical.

4,038,246

BUTADIENE RUBBERS STABILIZED WITH THIODIALKANOAMIDOPHENOLS

Martin Knell, Ossining, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

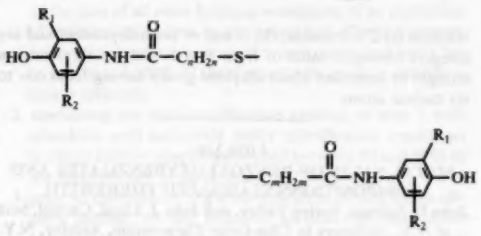
Continuation-in-part of Ser. No. 267,265, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 810,352, March 25, 1969, Pat. No. 3,679,744. This application Nov. 27, 1972, Ser. No. 309,847

The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.

Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—45.9 NC **7 Claims**

1. A butadiene rubber composition subject to oxidative and/or thermal containing from 0.01 to 5% by weight of the rubber of a thiodialkanoamidophenol having the structure



wherein
R_1 and R_2 are alkyl groups having from 1 to 6 carbon atoms, and
m and n are independently integers of from 1 to 10.

4,038,247

STABILIZING POLYOLEFINS WITH DIACYL DIHYDRAZIDES

Helmut Muller, Binningen; Siegfried Rosenberger, Riehen, and Heimo Brunetti, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 359,587, May 11, 1973, Pat. No. 3,894,990, which is a continuation of Ser. No. 141,027, May 6, 1971, Pat. No. 3,734,885. This application June 13, 1975, Ser. No. 586,835

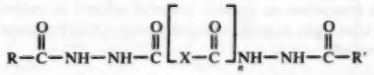
Claims priority, application Switzerland, May 19, 1970, 7371/70

The portion of the term of this patent subsequent to May 22, 1990, has been disclaimed.

Int. Cl.[2] C08K *5/25*

U.S. Cl. 260—45.9 NC **8 Claims**

1. A process for stabilizing homo- or copolymeric polyolefins, characterised by incorporating into said material from 0.01 to 5 percent by weight, calculated on the material to be stabilized, of a compound of the formula



whherein R and R′ independently of each other represent an aralkyl group which is substituted in its aryl moiety by one or two alkyl groups having each from 1 to 4 carbon atoms and a hydroxyl group or a phenyl group which is substituted by one or two alkyl groups having each from 1 to 4 carbon atoms and a hydroxyl group and X represents the direct bond, an alkylene radical having from 2 to 8 carbon atoms, a phenylene radical or a naphthylene radical, and n represents 0 or 1.

4,038,248

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

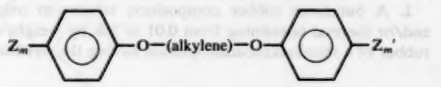
Filed Feb. 8, 1973, Ser. No. 330,782

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.[2] C08L *23/06*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising a polyolefin and a flame retardant, said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) *m* and *m'* are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,038,249

METAL SALTS OF BENZOYLOXYBENZOATES AND COMPOSITIONS STABILIZED THEREWITH

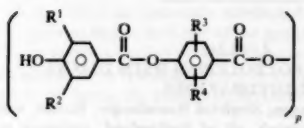
John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

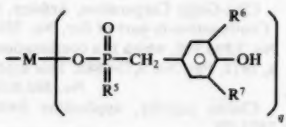
Division of Ser. No. 360,290, May 14, 1973, Pat. No. 3,920,712. This application July 30, 1975, Ser. No. 600,235

Int. Cl.[2] C08K *5/56, 5/53, 5/09;* **C07F** *15/04, 9/48, 9/46, 15/00*

U.S. Cl. 260—45.75 R **12 Claims**

1. A benzoyloxybenzoate having the formula





wherein

R^1 and R^2 are (lower)alkyl or (lower)cycloalkyl groups,

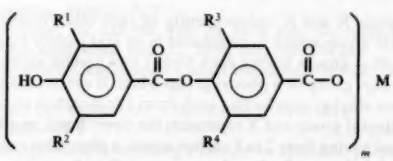
R^3 and R^4 are hydrogen, (lower)alkyl or (lower)cycloalkyl,

R^5 is (lower)alkyl, (lower)alkyloxy or phenyl,

R^6 and R^7 are (lower)alkyl,

M is a metal having a valency of 1 to 4, and *p* and *q* are integers, the sum of which equal the valency of M provided that neither *p* nor *q* is equal to *o*.

3. A composition of matter stabilized against degradation which comprises an organic material subject to oxidative and ultraviolet light degradation and a benzoyloxybenzoate having the formula



wherein

R^1 and R^2 are (lower)alkyl or (lower)cycloalkyl groups,

R^3 and R^4 are hydrogen, (lower)alkyl or (lower)cycloalkyl,

M is metal or an alkyl metal moiety, said metal having a valency of 1 to 4, and

m is an integer from 1 to 4.

4,038,250

LIGHT PROTECTING AGENTS

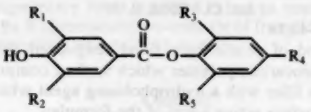
Hanns Lind, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 174,951, Aug. 25, 1971, abandoned. This application Apr. 24, 1975, Ser. No. 571,142

Int. Cl.[2] C07C *69/76*

U.S. Cl. 260—45.85 B **12 Claims**

1. Compound of the formula I



(I)

in which R_1 denotes alkyl with 1 to 5 carbon atoms, cycloalkyl with 5 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms, R_2 denotes α-branched alkyl with 3 to 8 carbon atoms, cycloalkyl with 5 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms, R_3 and R_5 independently of one another denote alkyl with 1 to 8 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl or chlorine and R_4 denotes hydrogen, alkyl with 1 to 18 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl or chlorine.

4,038,251

PROCESS FOR THE MANUFACTURE OF POLYADDITION PRODUCTS CONTAINING IMIDE GROUPS BY REACTION OF POLYMALEIMIDES WITH POLYHYDRIC PHENOLS USING AMINE CATALYST

Imre Forgö, Birsfelden; Bruno Schreiber, Basel; Alfred Renner, Munchenstein; Theobald Haug, Frenkendorf, all of Switzerland, and Andre' Schmitter, Hegenheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

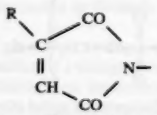
Filed Dec. 18, 1974, Ser. No. 534,105

Claims priority, application Switzerland, Dec. 21, 1973, 18047/73; Dec. 21, 1973, 18048/73

Int. Cl.[2] C08G *73/10;* **C08F** *222/40*

U.S. Cl. 260—47 NA **50 Claims**

1. Process for the manufacture of polyaddition products containing imide groups, wherein polyamides which contain, per molecule, at least two radicals of the formula



(I)

wherein R is hydrogen or methyl, are reacted with polyhydric phenols in the presence of amines at temperatures between 50° and 280° C.

4,038,252

PHASE BOUNDARY PROCESS FOR THE PREPARATION OF AROMATIC POLYCARBONATES USING A CHLORINATED AROMATIC HYDROCARBON AS THE POLYMER SOLVENT

Hugo Vernaleken, Krefeld, and Uwe Hucks, Duisburg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1975, Ser. No. 555,225
Claims priority, application Germany, Mar. 6, 1974, 2410716
Int. Cl.[2] C08G *63/62*
U.S. Cl. 260—47 XA 13 Claims

1. A process for the preparation of a polycarbonate by the phase boundary condensation method, by phosgenation of an aqueous alkali metal salt solution of one or more aromatic dihydroxy compounds, in which the process an aromatic chlorinated hydrocarbon is used as the solvent and the synthesis of the polycarbonate is carried out in two stages, in the first stage of which the reaction of the alkali metal salt solution of the aromatic dihydroxy compoumd(s) with phosgene is carried out at an OH concentration of between 0.01 and 0.1% by weight of OH, relative to the aqueous phase, in the presence of 0.1 to 2.5 mol% of trialkylamine, relative to aromatic dihydroxy compound(s), and at a temperature higher than about 70°C, with a dwell time of less than about 5 minutes, while in a second stage the polycondensation is effected by adjusting the OH concentration to about 0.20 to 0.50% by weight of OH, relative to the aqueous phase, optionally with further addition of trialkylamine, at a temperature higher than about 80°C with a dwell time of more than about 1 minute.

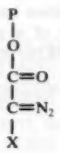
4,038,253

PHOTOCROSS-LINKABLE POLYMERS CONTAINING PENDANT DIAZOESTER GROUPS

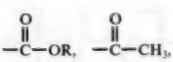
Brian D. Kramer, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 412,218, Nov. 2, 1973, abandoned. This application June 2, 1976, Ser. No. 692,166
Int. Cl.[2] C08F *116/02, 218/00;* C08B *31/00;* C07C *113/00*
U.S. Cl. 260—47 R 5 Claims

1. A polymer photocross-linkable to actinic radiation containing the following units



where P is derived from a soluble hydroxy containing polymer which has been esterified to give the above pendant groups and X is a radical selected from the group consisting of —H,



—CN and —Ar, where Ar is selected from phenyl and phenyl substituted with 1 to 3 $-NO_2$, Cl, F, Br, C_{1-8} alkyl or C_{1-5} alkyloxy groups and R is selected from C_{1-18} alkyl, C_{5-7} cycloalkyl, C_{1-4} alkyl substituted C_{5-7} cycloalkyl and Ar, where Ar is as defined above.

4,038,254

PROCESS FOR THE MANUFACTURE OF WIRE INSULATION VARNISH RESINS SUITABLE CHIEFLY FOR APPLICATION IN THE MELTED STATE

Gerhard Schade; Peter Uckert, and Manfred Fritz, all of Witten, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 446,063, Feb. 26, 1974, abandoned. This application Aug. 5, 1975, Ser. No. 602,032
Claims priority, application Germany, Mar. 1, 1973, 2310247
Int. Cl.[2] C08G *63/20, 63/68*
U.S. Cl. 260—75 N 12 Claims

1. A process for the manufacture of wire insulation varnish resins suitable for application in the melted state which comprises:

1. contacting a lower alkyl ester of terephthalic acid with tris-(2-hydroxyethyl)-isocyanurate and ethylene glycol in the presence of 0.3 to 1.5%, with reference to the weight of the sum of all resin forming monomers, of an alcoholate of titanium, vanadium or zirconium and effecting transesterification under transesterification conditions until between 90 and 100% of the theoretically possible esterification is effected;
2. contacting the transesterification product of step 1 with trimellitic acid anhydride under esterification conditions to effect further esterification until between 40 and 55% of the theoretically possible esterification is effected;
3. prior to completion of the esterification of step 2 immediately adding to the reaction mixture 4,4'-diaminodiphenylmethane in an amount such that the molar ratio of the trimellitic acid derived from trimellitic acid anhydride to said 4,4'-diaminodiphenylmethane is between 2.1 and 1.9:1; and
4. polycondensing the reaction mixture until a resin is formed having a melt viscosity between 5,000 and 20,000 cP at 140° to 160° C. such that it can be applied to a wire substrate in melted form.

4,038,255

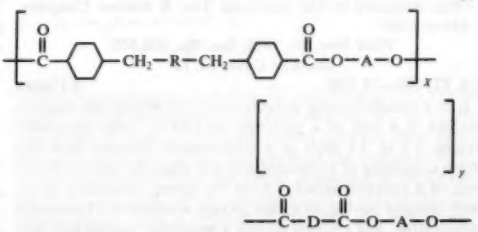
LINEAR POLYESTERS BASED ON N,N-HETEROCYCLIC DICARBOXYLIC ACIDS

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

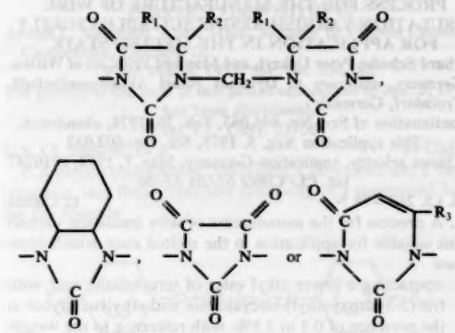
Filed Nov. 20, 1975, Ser. No. 633,771
Claims priority, application Switzerland, Nov. 29, 1974, 15866/74
Int. Cl.[2] C08G *63/12, 63/16*
U.S. Cl. 260—75 N 7 Claims

1. A linear, thermoplastic polyester having a relative viscosity of 1.2 to 3.0, measured at 30° C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, which is characterised by the structural elements of the general formula I

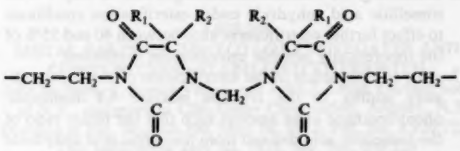
(I)



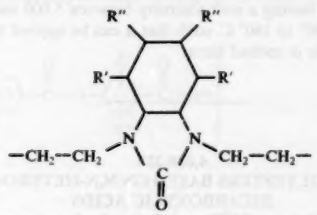
wherein R denotes a N,N-heterocyclic radical of the formula



wherein R_1 and R_2 independently of one another each denote hydrogen or alkyl having 1 to 3 C atoms, R_3 denotes hydrogen or methyl, A denotes an aliphatic radical having 2 to 6 C atoms, a N,N'-heterocyclic-aliphatic radical of the formula



or the formula



wherein R_1 and R_2 have the same meaning as above and R' and R'' represent H, chlorine or bromine atoms or R' represents a H atom and R'' represents a chlorine or bromine atom, D denotes meta- or para-phenylene and x and y represent integers, and the mol fraction $x/(x + y)$ derived from x and y can have values from 0.05 to 0.1.

4,038,256

NONSTAINING POLYURETHANE FROM CYCLOALIPHATIC OR ALIPHATIC DIISOCYANATES AND POLYHEXENEDIOL-PHTHALATES

Anthony F. Finelli, and Jeffrey W. Saracsan, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 24, 1975, Ser. No. 634,573
Int. Cl.[2] C08G 18/10
U.S. Cl. 260—75 NH **4 Claims**

1. In a nondiscoloring polyurethane comprising the reaction product of a mol of a polyester of 1800 to 3500 molecular weight, 1.3 to 3.2 mols of a diisocyanate selected from the group consisting of cycloaliphatic and aliphatic and 0.2 to 2.0 mols of a curative selected from the group consisting of organic diamine having no amino groups attached to a benzenoid carbon atom, and a polyol having a molecular weight less than 500 and mixtures of these the improvement wherein the polyester is polyhexanedoil-ortho-phthalate or a blend of 50 to 80 percent of polyhexanediol-ortho-phthalate and 50 to 20 percent of polyhexanediol isophthalate.

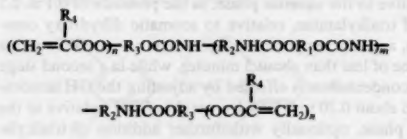
4,038,257

URETHANE MODIFIED ACRYLATE RESIN AND PROCESS FOR THE PRODUCTION THEREOF

Hajime Suzuki, and Hideo Miyake, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Sept. 19, 1975, Ser. No. 615,098
Claims priority, application Japan, Sept. 25, 1974, 49-110753
Int. Cl.[2] C08G 63/12
U.S. Cl. 260—75 NK **13 Claims**

1. A urethane modified acrylate which is expressed by the following general formula (I),



(I)

(where R_1 is a terephthalic oligoester residue, R_2 is an organic diisocyanate residue, R_3 is a polyhydric alcohol residue, R_4 is a hydrogen atom or methyl group, m is a number not more than 5 and n is an integer from 1 through 4).

4,038,258

ANTISTATIC COMPOSITION CONTAINING AN ALIPHATIC POLYESTER OR POLYETHER ESTER AND A PHOSPHONIUM SALT

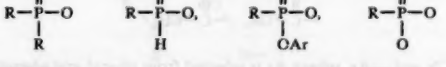
Gurdial Singh, Hockessin, Del., and Richard Edward Von Rutte, Riehen-Basel, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 614,230, Sept. 17, 1975, Pat. No. 4,005,057, which is a continuation-in-part of Ser. No. 403,334, Oct. 9, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 735,098
Int. Cl.[2] C08G 63/70, 63/16
U.S. Cl. 260—75 T **3 Claims**

1. An antistatic composition having a log R_v of less than 8 and consisting essentially of a polyether-ester or aliphatic polyester having a T_g (NMR) of less than 25° C and from 0.02 to 35 weight percent based on the weight of the composition of a phosphonium salt of the formula

$$[R_1R_2R_3R_4P^+]_n X^{n-}$$

where $R_1R_2R_3$ and R_4 each represents a monovalent hydrocarbon group of from 1–18 carbon atoms; X^{n-} is an organic anion selected from the group of



and $R\leftarrow SO_3\rightarrow_n$

wherein Ar is an aromatic hydrocarbon radical; R is an aliphatic or an aromatic hydrocarbon radical; m is 1 or 2; and n, the valence of the anion, is 1 or 2.

4,038,259
PRODUCTION OF P-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,332
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 12 Claims

1. A method for producing polymers comprising:
   a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one alkali metal carboxylate, at least one organic amide, and at least one alkali metal carbonate, and
   b. maintaining at least a portion of said composition at polymerization conditions to produce a polymer.

4,038,260
PRODUCTION OF p-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,333
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 12 Claims

1. A method for producing polymers comprising:
   a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one organic amide, and at one alkali metal sulfonate, and
   b. maintaining at least a portion of said composition at polymerization conditions to produce a p-phenylene sulfide polymer.

4,038,261
PRODUCTION OF BRANCHED ARYLENE SULFIDE POLYMERS

Willie W. Crouch, and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,334
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 14 Claims

1. A method of producing polymers comprising:
   a. forming a composition by contacting at least one p-dihalobenzene, at least one polyhalo aromatic compound having more than two halogen substituents per molecule, at least one alkali metal sulfide, at least one lithium salt chosen from lithium carboxylate and lithium chloride, N-methyl-2-pyrrolidone, and at least one alkali metal hydroxide, and
   b. maintaining at least a portion of said composition at polymerization conditions to produce a polymer.

4,038,262
PRODUCTION OF ARYLENE SULFIDE POLYMERS

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,338
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 12 Claims

1. A method for producing polymers comprising:
   a. forming a composition by contacting a p-dihalobenzene represented by the formula

where each X is selected from the group consisting of chlorine, bromine, and iodine, and each R is selected from the group consisting of hydrogen and hydrocarbyl in which the hydrocarbyl is an alkyl, cycloalkyl, or aryl radical or combination thereof, the total number of carbon atoms in each molecule being within the range of 6 to about 24, with the proviso that in at least 50 mole percent of the p-dihalobenzene employed each R must be hydrogen, with an alkali metal sulfide, an alkali metal hydroxide, N-methyl-2-pyrrolidone, carbon dioxide, and a compound chosen from among an alkali metal carboxylate and a lithium halide, and
   b. maintaining at least a portion of said composition at polymerization conditions for a time sufficient to produce a polymer.

4,038,263
PRODUCTION OF P-PHENYLENE SULFIDE POLYMERS

James T. Edmonds, Jr., and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,343
Int. Cl.[2] C08G 75/16
U.S. Cl. 260—79.1 15 Claims

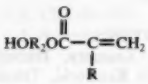
1. A method for producing polymers comprising:
   a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one organic amide, and at least one lithium halide, and
   b. maintaining at least a portion of said composition under polymerization conditions for a time sufficient to produce a polymer.

4,038,264
HEMA COPOLYMERS HAVING HIGH OXYGEN PERMEABILITY

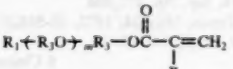
Martin Rostoker, East Windsor, N.J., and Leon Levine, Willow Grove, Pa., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 431,555, Jan. 7, 1974, abandoned. This application Nov. 22, 1974, Ser. No. 526,079
Int. Cl.[2] C08F 220/20
U.S. Cl. 260—79.3 M 55 Claims

1. A hydrophilic, water insoluble copolymer which is (A) a copolymer of 25 to 97.5% of a compound having the formula (1)



and 75 to 2.5% of a compound having the formula (2)



where R is hydrogen or methyl, R_2 is alkylene of 2 to 3 carbon atoms, m is an integer of 2 to 6, R_3 is alkylene of 2 to 3 carbon atoms and R_1 is alkoxy of 1 to 6 carbon atoms or (B) a copolymer of at least 50% of (1), up to 40% of (2), and up to 40% of a modifier selected from the group consisting of vinylpyrrolidone, vinylacetate, glycerol methacrylate, trimethylolpropane methacrylate, vinyl propionate sodium salt of 2-acrylamide-2-methylpropane sulfonic acid, polyvinyl pyrrolidone, vinylpyrrolidonevinylacetate copolymer and polyvinyl alcohol.

4,038,265

VINYL BENZYL ETHERS AND NONIONIC WATER SOLUBLE THICKENING AGENTS PREPARED THEREFROM

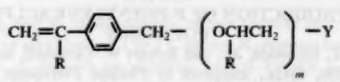
Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 489,876, July 18, 1974, Pat. No. 3,963,684, which is a division of Ser. No. 267,571, June 29, 1972. This application Oct. 28, 1975, Ser. No. 626,011

Int. Cl.[2] C08F *220/56*

U.S. Cl. 260—79.7 **2 Claims**

1. A nonionic water soluble binary copolymeric thickening agent composed of in polymerized form about 1 to 5 mole percent of a vinyl benzyl ether monomer and the balance to make 100 percent of acrylamide, said ether monomer having the formula



wherein R is hydrogen or methyl, m is about 10 to 100 and Y is where R_1 is an alkyl, aralkyl or alkaryl hydrophobic group of 10 to about 22 carbon atoms.

4,038,266

AZO-BISANHYDRIDE OF TRIMELLITIC ANHYDRIDE

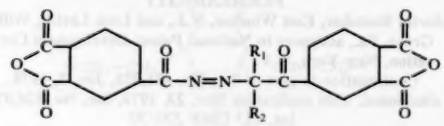
Kerford A. Marchant, Jr., Evanston, and David J. Fenoglio, Carol Stream, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 414,351, Nov. 9, 1973, Pat. No. 3,989,669. This application Dec. 22, 1975, Ser. No. 643,471

Int. Cl.[2] C07C *107/00*; C09B *27/00*; C08G *63/12, 69/44*

U.S. Cl. 260—152 **3 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are selected from the group consisting of alkyl containing from 1 to 6 carbon atoms, halogenated alkyl containing from 1 to 6 carbon atoms and a phenyl.

4,038,267

TRIAZINE REACTIVE DYES

Yoshihisa Sueda, Toyonaka; Suketsugu Koumura, Ibaragi; Kazuyoshi Hirabayashi, Ikeda; Hirohito Kenmochi, Takatsuki; Hisashige Terao, Toyonaka, and Yoshio Mori, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

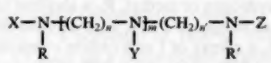
Filed May 21, 1974, Ser. No. 471,986

Claims priority, application Japan, May 24, 1973, 48-58829

Int. Cl.[2] C09B *43/16, 33/00, 35/00*

U.S. Cl. 260—153 **6 Claims**

1. A compound of the formula,



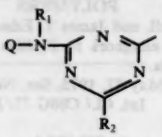
wherein

R and R′ each are hydrogen, C_1–C_4 alkyl or C_1–C_4 hydroxyalkyl,

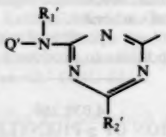
m is an integer of 1 to 5,

n and *n*′ each are an integer of 2 or 3,

X is hydrogen or a group of the formula

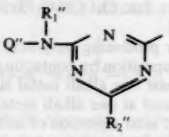


Y is hydrogen or a group of the formula



and

Z is hydrogen or a group of the formula

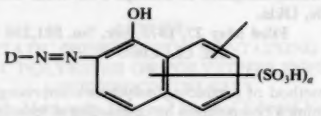


wherein

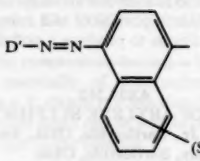
R_1, R_1′ and R_1″ each are hydrogen or C_1–C_4 alkyl,

R_2, R_2′ and R_2″ each are halogen, and

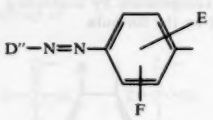
Q, Q′ and Q″ each are independently one member selected from a group consisting of members of the formulae as a free acid form,



wherein D is a diazo-component of benzene or naphthalene series which may contain an azo group, and *a* is 1 or 2,

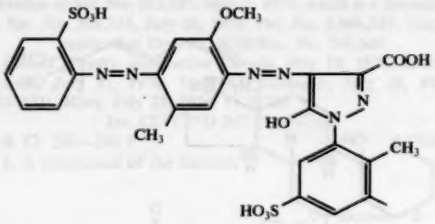


wherein D′ is a diazo-component of benzene or naphthalene series which may contain an azo group, and *b* is 0 or 1,



wherein D″ is a diazo-component of benzene or naphthalene series which may contain an azo group or a coupling component of benzene, naphthalene or pyrazolone series, E is hydrogen, halogen, methyl, methoxy, ethoxy or sulfo and F is hydrogen, methyl, methoxy, ethoxy, sulfo or

wherein R_3 is hydrogen or C_1–C_4 alkyl, and G is C_2–C_5 alkylcarbonyl, C_1–C_4 alkylsulfonyl, or carbamoyl with the proviso that E and F are hydrogen or sulfo when D" is a coupling component, and



wherein Q, Q' and Q" may independently be the same or different, and X, Y and Z are not hydrogen at the same time.

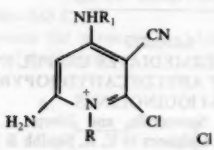
4,038,268

PROCESS FOR PREPARING AZO DYESTUFFS CONTAINING 2,4,6-TRI-AMINO-3-(CYANO ESTER OR CARBONAMIDE)PYRIDINE

Karl Ludwig Moritz, Cologne, and Karl Heinz Schundehutte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

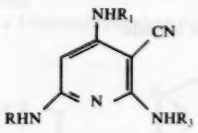
Continuation-in-part of Ser. No. 442,621, Feb. 14, 1974, Pat. No. 4,006,128. This application Aug. 12, 1974, Ser. No. 496,715
Claims priority, application Germany, Feb. 14, 1973, 2307168
Int. Cl.[2] C09B *29/36;* **C07D** *213/38*
U.S. Cl. 260—156 **11 Claims**

1. A process for preparing an azo dyestuff comprising
a. reacting



(III)

with at least two equivalents of R_3NH_2 at a temperature of 110° to 130° C to form

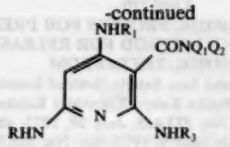


IV

b. and then coupling IV, V or VI with diazotized DNH_2 wherein
V and VI are prepared by converting IV to

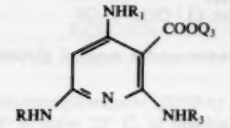
V

-continued



or

VI



by reaction at the cyano group; in which
D is the radical of a diazo component;
R is C_1–C_6-alkyl; C_1–C_6-alkyl substituted by halogen, CN, OH, C_1–C_4-alkoxy or C_2–C_5-alkoxycarbonyl; cyclohexyl; methyl-cyclohexyl; phenyl; phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or cyano; benzyl; phenethyl; or benzyl or phenethyl substituted with chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy;
R_1 and Q_3 are independently C_1–C_6-alkyl; C_1–C_6-alkyl substituted with halogen, cyano, hydroxyl, C_1–C_4-alkoxy or C_2–C_5-alkoxycarbonyl; benzyl; phenethyl; benzyl or phenethyl substituted by chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy;
Q_1 and Q_2 are independently of one another hydrogen, R or conjointly with the nitrogen atom form a morpholine, piperidine or pyrrolidine ring; and
R_3 is C_1–C_4-alkyl; C_1–C_4-alkyl substituted by hydroxy, methoxy or ethoxy; benzyl; phenethyl; benzyl or phenethyl substituted by chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy; phenyl; or phenyl substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or cyano.

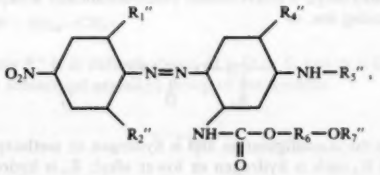
4,038,269

2'-ALKOXYACYLAMINO-4'-ALKYLAMINO-4-NITRO-1,1'-AZOBENZENE DISPERSE DYES

Wolfgang Groebke, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 410,479, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 138,760, April 29, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,244
Claims priority, application Switzerland, May 6, 1970, 6808/70; Dec. 29, 1970, 19249/70; May 16, 1973, 6908/73
Int. Cl.[2] C09B *29/08, 29/26*
U.S. Cl. 260—207 **18 Claims**

1. A compound of the formula



wherein
R_1– is cyano or nitro,
R_2" is chloro, bromo or cyano,
R_4" is hydrogen, methoxy or ethoxy,
R_5" is alkyl of 2 or 3 carbon atoms monosubstituted by cyano or alkoxycarbonyl wherein the alkoxy radical has 1 to 4 atoms,
R_6 is alkylene of 2 or 3 carbon atoms, and
R_7" is alkyl of 1 to 4 carbon atoms.

4,038,270

MENTHOL GLYCOSIDE, PROCESS FOR PREPARING THE SAME AND METHOD FOR RELEASING MENTHOL THEREFROM

Tatsuo Higashiyama, and Isao Sakata, both of Kasaoka, Japan, assignors to Toyo Hakka Kobyo Kabushiki Kaisha, Japan

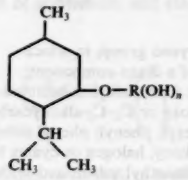
Continuation of Ser. No. 273,455, July 20, 1972, abandoned. This application June 9, 1975, Ser. No. 584,855

Claims priority, application Japan, Aug. 27, 1971, 46-065616; Aug. 27, 1971, 46-065617

Int. Cl.[2] C07H *15/20*

U.S. Cl. 536—4 **8 Claims**

1. A substantially water-soluble menthol glycoside having the general formula:



where R is the residue of lactose, maltose or raffinose and n is the number of hydroxyl groups on said residue.

4,038,271

[[[(2,4-DIOXO-1-IMIDAZOLIDINYL)AMINO]-CARBONYL]AMINO]ACETYLPENICILLIN DERIVATIVES

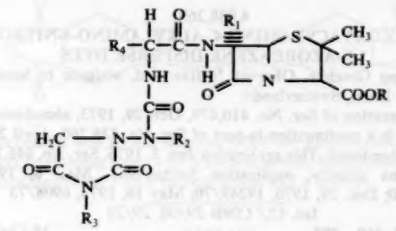
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 8, 1976, Ser. No. 740,163

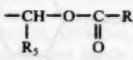
Int. Cl.[2] C07D *499/64, 499/66, 499/68, 499/70*

U.S. Cl. 260—239.1 **32 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(-lower alkyl)silyl, a conventional pharmaceutically acceptable salt forming ion, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2, R_3 and R_5 each is hydrogen or lower alkyl; R_4 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy and hydroxy, or a substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl; and R_6 is lower alkyl.

4,038,272

STEREOSPECIFIC SYNTHESES OF 24R,25- AND 24S,25-DIHYDROXYCHOLESTEROL AND ALKANOYL DERIVATIVES THEREOF

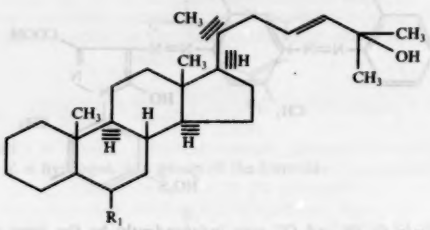
John Joseph Partridge, Jr., and Milan Radoje Uskokovic, both of Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 20, 1975, Ser. No. 623,859

Int. Cl.[2] C07J *71/00, 53/00*

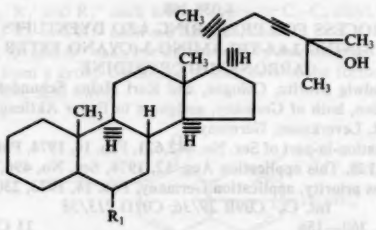
U.S. Cl. 260—239.55 R **63 Claims**

1. A process for the preparation of a compound of the formula



wherein R_1 is hydroxy, lower alkoxy, phenyl lower alkoxy, lower alkanoyloxy or benzoyloxy

and the configuration of the 23, 24-double bond it trans, i.e., where the 23, 24-double bond has the E-configuration, which comprises contacting a compound of the formula



wherein R_1 is as above,

with a complex metal hydride reducing agent in an etheral organic solvent.

4,038,273

PIPERIDONE INTERMEDIATES USEFUL IN THE PREPARATION OF ARYLDECAHYDROPYRROLO [3,4-f]QUINOLINES

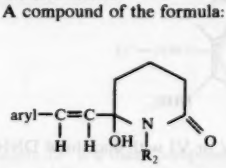
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 549,581, Feb. 13, 1975, Pat. No. 3,963,724, which is a division of Ser. No. 374,593, June 28, 1973, Pat. No. 3,891,652. This application Mar. 30, 1976, Ser. No. 671,791

Int. Cl.[2] C07D *211/40*

U.S. Cl. 260—240 D **5 Claims**

1. A compound of the formula:



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, aryl-lower alkyl, and styryl; and aryl is selected from the group consisting of phenyl, naphthyl,

substituted phenyl and substituted naphthyl wherein said substituent is selected from the group consisting of lower alkyl, lower alkoxy, di(lower alkyl)amino, halogen, and trifluoromethyl.

4,038,274
CNS ACTIVE COMPOUNDS

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

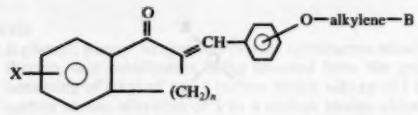
Division of Ser. No. 682,695, May 3, 1976, which is a division of Ser. No. 599,732, July 28, 1975, Pat. No. 3,969,527. This application Dec. 10, 1976, Ser. No. 749,644

Claims priority, application Canada, July 15, 1976, 257036; France, July 27, 1976, 76.22885; Germany, July 28, 1976, 2633931; Japan, July 28, 1976, 51-91264

Int. Cl.[2] C07D *207/24, 295/02*

U.S. Cl. 260—240 F **6 Claims**

1. A compound of the formula



wherein X is a member selected from the group consisting of H, halogen, alkyl of from 1 to 8 carbons, lower alkoxy or CF_3; *n* is 1, 2 or 3; B is a member selected from the group consisting of piperidino, pyrrolidino, morpholino, N-lower alkylpiperazino, or N-(2-hydroxyethyl)piperazino; and alkylene is a straight or branched saturated hydrocarbon chain group containing from 2 to about 5 carbons; and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

4,038,275
PROCESS FOR PREPARATION OF 3-HYDROXYMETHYLCEPHEMS

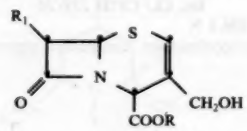
Gary A. Koppel, Indianapolis, Ind., and Laurence J. Nummy, Cambridge, Mass., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 19, 1976, Ser. No. 678,086

Int. Cl.[2] C07D *501/04*

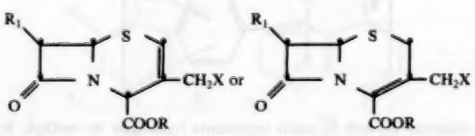
U.S. Cl. 260—243 C **9 Claims**

1. A process for preparing a 3-hydroxymethyl-2-cephem compound of the formula

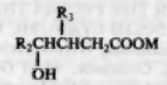


which comprises

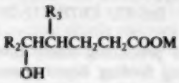
1. reacting a 3-halomethylcephem compound of the formula



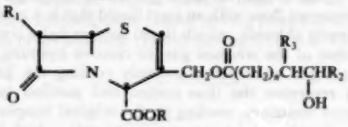
with from about 1 to about 1.3 equivalents of a salt of a γ-hydroxycarboxylic acid of the formula



or a salt of a δ-hydroxycarboxylic acid of the formula



in hexamethylphosphoramide (HMPA) at a temperature of about −10° to about 25° C. to provide a mixture of the 2-cephem hydroxy ester of the formula



and the corresponding 3-cephem hydroxy ester; and

2. reacting in an inert organic solvent the product 2-cephem hydroxy ester with a protic acid having a pK value of less than about 4.0;

wherein in the above formulae

X is chloro, bromo, or iodo;

M is an alkali metal cation;

n is 1 or 2;

R is a carboxylic acid protecting group;

R_2 and R_3 are independently hydrogen, ethyl or methyl; and

R_1 is an amido group of the formula

wherein R_4 is

a. hydrogen, C_1–C_3 alkyl, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl or 4-protected amino-4-protected carboxybutyl;

b. benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;

c. the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_3 alkyl, and C_1–C_7 alkoxy;

d. an arylalkyl group of the formula

wherein R″ is as defined above, Q is O or S, and *m* is O or 1;

e. a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl or 3-thienyl, and W is protected hydroxy, protected carboxy or protected amino; or

f. a heteroarylmethyl group of the formula

wherein R⁗ is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, and 1-tetrazolyl.

4,038,276

PROCESS FOR THE PRODUCTION OF FINELY DIVIDED SOLID CYANURIC CHLORIDE

Friedhelm Geiger, Erlensee; Werner Heimberger, Hanau, and Theodor Lussling, Constance, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Aug. 20, 1976, Ser. No. 716,353
Claims priority, application Germany, Aug. 23, 1975, 2537673
Int. Cl.[2] C07D *251/28*
U.S. Cl. 260—248 C 10 Claims

1. A process of producing finely divided solid cyanuric chloride comprising feeding liquid cyanuric chloride into a separatory container, cooling the liquid cyanuric chloride with recycling inert gas to such an extent that the cyanuric chloride separates in crystalline form, passing and thereby warmed inert gas now containing cyanuric chloride vapor from said separatory container through a conduit into a washing column, washing the cyanuric chloride laden gas in said washing column by countercurrent flow with an inert liquid that is a good solvent for cyanuric chloride, which liquid solvent has a temperature below that of the warmed gas, to remove cyanuric chloride from said gas while simultaneously cooling the gas, subsequently returning the thus cooled and purified gas to the separatory container, cooling to the original temperature the washing liquid containing cyanuric chloride, which liquid had increased in temperature in the washing process and spraying the inside of the conduit connecting the separatory container and washing column constantly with the cooled washing liquid, dividing a partial stream of the cyanuric chloride containing washing liquid in a distillation column into a pure liquid cyanuric chloride fraction, and a pure washing liquid, recycling the pure liquid cyanuric chloride into the separatory column and recycling the pure washing liquid into the washing column.

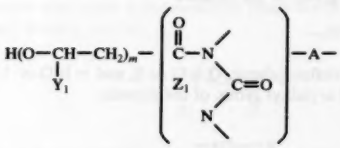
4,038,277

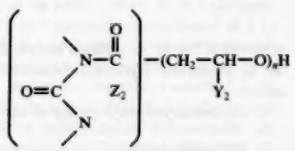
MONO- AND DIALCOHOLS OF FIVE OR SIX MEMBERED N-HETEROCYCLIC COMPOUNDS, CONTAINING TWO NH GROUPS PER MOLECULE

Juergen Habermeier, Allschwil; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

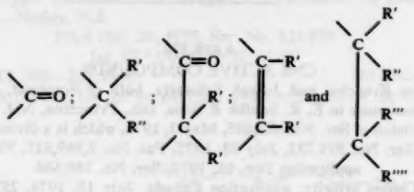
Continuation of Ser. No. 82,072, Oct. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 1,289, Jan. 7, 1970, Pat. No. 3,679,681. This application May 15, 1975, Ser. No. 577,965
Claims priority, application Switzerland, Jan. 24, 1969, 1104/69
Int. Cl.[2] C07D *239/54, 233/72*
U.S. Cl. 260—256.4 C 11 Claims

1. A mono-or dialcohol of the formula





wherein Y_1 and Y_2 each represents a member selected from the group consisting of hydrogen and methyl, A represents alkylene containing from 1 to 12 carbon atoms, diethylene ether or tetrachloro-p-xylene and Z_1 and Z_2 each represents a member selected from the group consisting of a divalent residue of the formulae



wherein R′, R″, R‴ and R⁗ each represents a member selected from the group consisting of alkyl with 1 to 5 carbon atoms, alkenyl with up to 5 carbon atoms, cyclohexyl, cyclohexenyl, phenyl, or when the residue Z_1 and Z_2 represents the formula

wherein R′ and R″ together can also form a member selected from the group consisting of tetramethylene and pentamethylene, and *m* and *n* each represents an integer having a value of from 0 to 6.7 (average value) with the sum of *m* and *n* having to be at least 1.

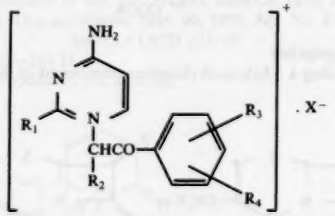
4,038,278

4-AMINOPYRIMIDIUM DERIVATIVES AND PREPARATION THEREOF

Sachiyuki Hamano, Tokyo, and Takaharu Nakamura, Shounan, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1975, Ser. No. 603,235
Claims priority, application Japan, Aug. 9, 1974, 49-90783
Int. Cl.[2] C07D *239/26*
U.S. Cl. 260—256.4 N 4 Claims

1. A 4-aminopyrimidium compound represented by the formula:



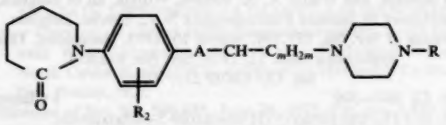
wherein R_1 and R_2 each represents hydrogen or methyl, R_3 represents a methylsulfonyl, methoxycarbonyl, nitro, methyl, chlorine, fluorine or amino group, R_4 is hydrogen or chlorine and X is bromine.

4,038,279
N-ARYL-N'-(PHENYL-OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 427,367, Dec. 21, 1973, Pat. No. 3,941,787. This application Dec. 1, 1975, Ser. No. 636,734
Claims priority, application Germany, Dec. 23, 1972, 2263211
Int. Cl.[2] C07D *401/14*
U.S. Cl. 260—268 BQ **3 Claims**

1. A racemic or optically active compound of the formula



wherein

R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; tetrahydronaphthyl; indanyl; pyridyl, quinolyl; or thiazolyl;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen;

A is a single carbon-to-carbon bond or $—OCH_2—$;

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanoyloxy of 1 to 4 carbon atoms; and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

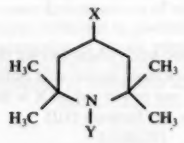
4,038,280
HYDROXYARYL-TETRAMETHYL-PIPERIDINES

Donald Richard Randell, Stockport, and Malcolm John Smith, Marple, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

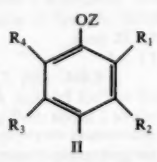
Filed Nov. 28, 1972, Ser. No. 310,060
Claims priority, application United Kingdom, Nov. 30, 1971, 55419/71; July 14, 1972, 32947/72
Int. Cl.[2] C07D *211/22*
U.S. Cl. 260—293.84 **8 Claims**

1. A compound of the formula I

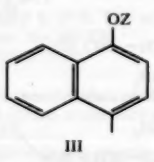
I



or a salt thereof, wherein the substituent X has one of the formulae



II



III

wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen, a straight- or branched-chain alkyl residue having from 1 to 9 carbon atoms, a cycloalkyl residue having from 5 to 14 carbon atoms, an aralkyl residue having from 7 to 14 carbon atoms or an aryl or alkaryl residue having from 6 to 14 carbon atoms,

Y is hydrogen, O, a straight- or branched-chain alkyl residue having from 1 to 12 carbon atoms, an alkenyl or alkynyl residue having from 3 to 12 carbon atoms or an aralkyl residue having from 7 to 12 carbon atoms.

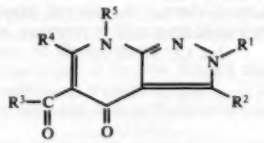
Z is hydrogen, an alkyl residue having from 1 to 20 carbon atoms, an alkenyl or alkynyl residue having from 2 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms, an araliphatic residue having from 7 to 12 carbon atoms, an aromatic residue having from 6 to 12 carbon atoms or a β-hydroxyethyl, β-cyonoethyl, furan or thiophene residue or the group $—COZ_1$ wherein Z_1 has the same significance as Z, or Z_1 is a group having the formula $—NR_5R_6$ wherein R_5 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, and R_6 is hydrogen, an aliphatic residue having from 1 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms or an aromatic residue having from 6 to 12 carbon atoms.

4,038,281
CERTAIN 2,7-DIHYDRO-4H-PYRAZOLO[3,4-B]PYRIDINE-5-KETONES

Theodor Denzel, and Hans Hoehn, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 623,150, Oct. 16, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,498
Int. Cl.[2] C07D *471/04*
U.S. Cl. 260—296 H **12 Claims**

1. A compound of the formula



wherein

R^1 is lower alkyl, phenyl or phenyl-lower alkylene;

R^2 and R^4 each is hydrogen or lower alkyl;

R^3 is lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is lower alkyl, carboxy, halogen or amino;

R^5 is lower alkyl, cyclo-lower alkyl, phenyl-lower alkylene, amino-lower alkylene or di-lower alkylamino-lower alkylene;

and physiologically acceptable acid addition salts thereof.

4,038,282
PYRIDYL-4-METHYL-SUCCINIMIDOCARBONATE AND PROCESS FOR ITS PREPARATION

Ralph F. Hirschmann, Blue Bell, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 635,465, Nov. 26, 1975, which is a continuation-in-part of Ser. No. 393,351, Sept. 6, 1973, Pat. No. 3,950,348, which is a division of Ser. No. 214,384, Dec. 30, 1971, Pat. No. 3,780,015. This application June 14, 1976, Ser. No. 695,607
Int. Cl.[2] C07D *401/06*
U.S. Cl. 260—295 D **2 Claims**

1. The process which comprises reacting 4-pyridylcarbinol with succinimido-chloroformate, said reaction being carried out in substantially anhydrous ethyl acetate or halogenated hydrocarbon solvent while maintaining the temperature within the range of about −20° C. to 0° C., adding a tertiary amine to

the solution, and maintaining the resulting solution at a temperature of about 0° C. to 5° C. for a period of about 15 minutes, thereby forming pyridyl-4-methyl-succinimidocarbonate.

4,038,283

4-ALKOXY OR HYDROXY DERIVATIVES OF 2H-PYRAZOLO[3,4-B]PYRIDINE-5-CARBOXYLIC ACIDS AND ESTERS

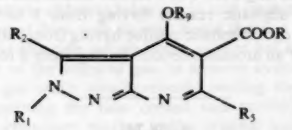
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 573,195, April 30, 1975. This application Oct. 14, 1976, Ser. No. 732,241

Int. Cl.[2] C07D *471/04*

U.S. Cl. 260—295.5 B **12 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is lower alkyl, phenyl, or phenyl-lower alkyl; R_2 is hydrogen or lower alkyl; R_5 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R_9 is hydrogen or lower alkyl; and the pharmaceutically acceptable salt thereof.

4,038,284

N-ACYLATION OF OXAZOLIDINES

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 599,793, July 28, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 646,823

Int. Cl.[2] C07D *263/04*

U.S. Cl. 260—307 FA **14 Claims**

3. A process according to Claim 1 in which the hydrogen chloride acceptor is an alkali metal hydroxide.

4,038,285

1-(2-CARBOXYARYL)-4-ARYLIMIDAZOLES AND 1-(2-CARBOXYARYL)-3-ARYL-1,2,4-TRIAZOLES

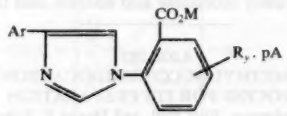
Alexander Lawrence Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1975, Ser. No. 590,372

Int. Cl.[2] C07D *233/64*

U.S. Cl. 260—309 **7 Claims**

1. A compound of the formula



in which

Ar is phenyl, naphthyl, biphenylyl, furyl, thienyl or phenyl substituted with up to two of fluorine, chlorine, bromine, iodine, alkyl of 1–5 carbons, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxy, dimethylamino, cyano, acetyl, methylsulfony, carbamoyl or sulfamyl;

R is hydrogen, fluorine, chlorine, bromine, iodine, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxyl or alkyl of 1–5 carbon atoms;

p is 0 or 1;

y is 1 or 2;

A is an acid;

M is hydrogen, sodium, potassium, lithium, calcium or magnesium; with the proviso that when M is other than hydrogen, *p* is 0.

4,038,286

RACEMATES AND OPTICAL ISOMERS OF 1-(1-PHENYLETHYL)-1H-IMIDAZOLE-5-CARBOYLIC ACID DERIVATIVES

Leopold Fr. C. Roevens, Rijkevorsel; Jozef J. P. Heykants, Vosselaar, and Walter A. M. Helsen, Wilrijk, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 557,194, March 10, 1975, abandoned. This application Sept. 12, 1975, Ser. No. 612,835

Int. Cl.[2] C07D *233/90*

U.S. Cl. 260—309 **6 Claims**

1. di-1-(1-Phenylethyl)-1H-imidazole-5-carboxamide.

4. d1-1-(1-Phenylethyl)-1H-imidazole-5-carbonitrile.

4,038,287

COMPOUNDS OF ALLANTOIN WITH BASIC AMINO ACIDS

Hirohide Takayama, Ogose; Kiyoshi Niino, Hidaka, and Sigeo Fukuda, Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd., Tokyo, Japan

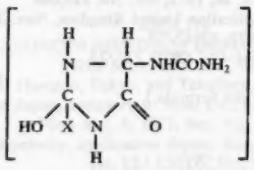
Filed Apr. 12, 1976, Ser. No. 676,134

Claims priority, application Japan, Apr. 21, 1975, 50-48506; Aug. 18, 1975, 50-99466; Aug. 18, 1975, 50-99467

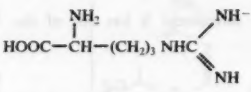
Int. Cl.[2] C07D *233/48*

U.S. Cl. 260—309.7 **6 Claims**

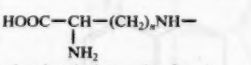
1. A compound of the formula



in which X is a basic amino acid radical having the formula (II) or the formula (III), X' is a basic amino acid radical having the formula (IV), *m* is zero, one or two when X is the formula (II) and *m* is zero when X is the formula (III)

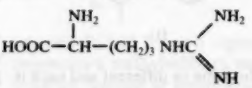


(II)



(III)

wherein n is the number 3 or 4,



(IV)

4,038,288

DITHIOCARBAMATE ESTER BACTERICIDES AND FUNGICIDES

Thomas Andrew Lies, Montgomery Township, Mercer County, and James Wellington Clapp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 323,169, Jan. 12, 1973, abandoned, which is a division of Ser. No. 127,825, March 24, 1971, Pat. No. 3,723,494. This application Apr. 18, 1975, Ser. No. 569,243

Int. Cl.[2] C07D *333/00*

U.S. Cl. 260—329 S 2 Claims

1. A compound according to the formula: α-(Nitromethyl)-2-thienyl dimethyldithiocarbamate.

4,038,289

CERTAIN 2-HYDROXY-2,4-DIARYL-3-FURANONES

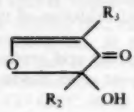
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 590,655, June 26, 1975, Pat. No. 3,969,373, which is a continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,163

Int. Cl.[2] C07D *307/58*

U.S. Cl. 260—347.3 4 Claims

1. A compound of the formula:



wherein R_2 is phenyl lower-alkoxyphenyl, and di-lower-alkoxyphenyl and R_3 is phenyl, carboxyphenyl, carboxylowerallylphenyl, or nitrophenyl.

4,038,290

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,004

Int. Cl.[2] C07D *301/20*

U.S. Cl. 260—348.5 L 2 Claims

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and aluminum.

4,038,291

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application June 25, 1976, Ser. No. 699,836

Int. Cl.[2] C07D *301/20*

U.S. Cl. 260—348.5 L 2 Claims

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° C to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and manganese.

4,038,292

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application June 25, 1976, Ser. No. 699,839

Int. Cl.[2] C07D *301/20*

U.S. Cl. 260—348.5 L 2 Claims

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and calcium.

4,038,293

SILICONE-COMPATIBLE TRIS(TRIMETHYLSILILYLOXY)SILYLALKYLAMINO-SUBSTITUTED QUINONOID DYESTUFFS

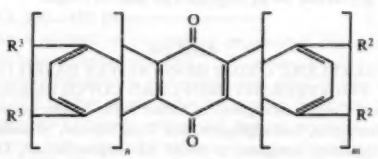
Carl Mayn Smith, Sun City, Ariz., and George V. D. Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 501,210, Aug. 28, 1974, abandoned, which is a division of Ser. No. 275,190, July 26, 1972, Pat. No. 3,888,891. This application Dec. 4, 1975, Ser. No. 637,815

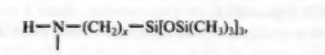
Int. Cl.[2] C07C *97/20, 97/22, 97/24;* C07F *7/10*

U.S. Cl. 260—378 4 Claims

1. A quinonoid dyestuff of the formula:



wherein each R^2 and R^3 individually is hydrogen, hydroxyl or



x is 1 to 6, n and m are independently 0 or 1 and $n \leqq m$ and provided that when $n = 0$ and $m = 1$ R^3 is hydrogen and that when n and m are both 0 ones each of R^2 and R^3 is hydrogen, and at least one R^3 or R^2 is

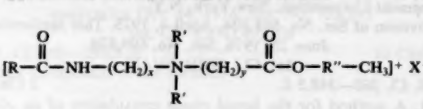
4,038,294

FATTY HALO ALKANOATE QUATERNARIES OF DIALKYLAMINOPROPYLAMIDES

Donald E. Conner, Clifton, and Arnold W. Fogel, Park Ridge, both of N.J., assignors to Van Dyk & Company, Incorporated, Belleville, N.J.

Filed Apr. 13, 1976, Ser. No. 676,416
Int. Cl.[2] C09F 5/00; C11C 3/00
U.S. Cl. 260—404.5 6 Claims

1. As a novel emollient, hair conditioning, composition of matter a fatty halo alkanoate quaternary of dialkyl amino propyl amides, corresponding to the formula



wherein the RCO moiety is selected from the group consisting of gluconic acid, and C_7-C_{21} fatty acids; R′ is an alkyl group having from 1 to 2 carbon atoms; x is an integer of from 2 to 3; y is an integer of from 1 to 3; R″ is selected from the group consisting of $(CH_2)_{(7\text{-}21)}$ and sorbate; and X is halogen.

4,038,295

PROCESS FOR THE SELECTIVE HYDROGENATION OF POLYUNSATURATED OILS

Robert Stern, Paris; Eugène Ucciani, Marseille; André Hirschauer, Montesson, and Georges Cecchi, Marseille, all of France, assignors to Institut Francais du Petrole et Institut des Corps Gras (ITERG), Rueil-Malmaison, France

Filed Jan. 29, 1975, Ser. No. 545,189
Claims priority, application France, Feb. 1, 1974, 74.03365
Int. Cl.[2] C11C 3/12
U.S. Cl. 260—409 24 Claims

1. In a process for selectively hydrogenating a polyunsaturated glyceridic oil of vegetable or animal origin, wherein hydrogen is reacted with said oil in contact with a catalyst obtained by reacting in a solvent: (a) at least one compound of a metal from groups I B, IV B, V B, VI B, VII B and VIII with (b) at least one reducing organic compound having at least one carbon metal bond or hydride or a metal from groups I A, II A, II B and III A, the molar ratio of the reducing compound to the metal compound being from 0.1 to 1 to 6:1, the improvement wherein said solvent consists essentially of a polyunsaturated glyceridic oil of vegetable or animal origin.

4,038,296

ALKYLENE OXIDE DERIVATIVES BASED ON POLYTETRAHYDROFURAN COPOLYMERS

Norbert Greif, Ludwigshafen; Heinz Bille, Limburgerhof; Rolf Fikentscher, Ludwigshafen, and Toni Simenc, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 3, 1975, Ser. No. 538,453
Claims priority, application Germany, Jan. 16, 1974, 2401855
Int. Cl.[2] C07C 43/04, 69/22, 69/58
U.S. Cl. 260—410.6 10 Claims

1. A polyalkylene oxide adduct of the formula

R — X

wherein R is the radical of a monoalcohol of 8 to 22 carbon atoms, of a monocarboxylic acid of 8 to 22 carbon atoms or of their oxalkylation products with from 1 to 20 moles of an epoxide of 2 to 3 carbon atoms and X is the radical of a copolymer of an epoxide of 2 or 3 carbon atoms and tetrahydrofuran, with the proviso that the total amount of epoxide and tetrahydrofuran units in R—X is from 60 to 95 per cent by weight and that the molar ratio of epoxide units to tetrahydrofuran units is from 1:0.5 to 1:3.

4,038,297

HIGH MOLECULAR WEIGHT MONOCARBOXYLIC ACIDS AND OZONIZATION PROCESS FOR THEIR PREPARATION

Herbert G. Rodenberg, and Charles E. Patton, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 361,205, May 17, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,891
Int. Cl.[2] G07C 51/32
U.S. Cl. 260—413 12 Claims

1. A process for the preparation of mixed high molecular weight aliphatic straight-chain monocarboxylic acids wherein less than 30% by weight of the acids have fewer than 22 carbon atoms, less than 20% by weight of the acids have greater than 35 carbon atoms, acids in the $C_{22\text{-}35}$ range constitute at least 55% or more of the total acid product and the ratio of odd to even carbon content acids in the $C_{22\text{-}35}$ range is between about 1.5:1 and 10:1 which comprises:

1. reacting ozone and an olefin having from 22 to 60 carbon atoms, of which 60% or more are α-olefins, at a temperature from about 50° C to 100° C in the presence of a participating monocarboxylic acid solvent containing from about 4 to 13 carbon atoms, the weight ratio of said olefin to participating solvent ranging between about 2:1 to 1:10;
2. treating the resulting olefin ozonide of step (1) with oxygen at a temperature from about 75° C to about 145° C to effect scission and oxidation of the ozonide to the acid products; and
3. recovering the mixed acid product by stripping off the participating solvent at an elevated temperature and reduced pressure.

2. A mixed acid composition obtained by the process of claim 1, consisting essentially of high molecular weight aliphatic straight-chain monocarboxylic acids wherein less than 30% by weight of the acids have fewer than 22 carbon atoms, less than 20% by weight of the acids have greater than 35 carbon atoms, acids in the $C_{22\text{-}35}$ range constitute at least 55% or more of the total acid product and the ratio of odd to even carbon content acids in the $C_{22\text{-}35}$ range is between about 1.5:1 and 10:1.

7. The process of claim 1 wherein the recovered mixed acid product is bleached with ozone and recrystallized to improve the color.

4,038,298

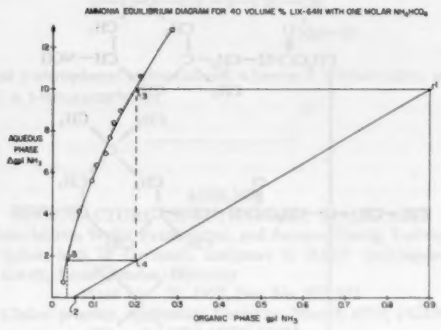
REMOVING AMMONIA FROM SOLUTIONS OF OXIME-METAL CHELATE

Roald R. Skarbo, Lexington; Robert E. Lueders, Needham, both of Mass.; Edmond A. Morin, Aurora, and Hal D. Peterson, Boulder, both of Colo., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation of Ser. No. 317,003, Dec. 20, 1972, abandoned. This application Sept. 8, 1975, Ser. No. 610,935
Int. Cl.[2] C07F 1/08, 15/04
U.S. Cl. 260—429 J 12 Claims

1. A process for selectively removing ammonia from an organic oxime extractant chelated with a metal and containing ammonia comprising, countercurrently contacting the organic extractant with an aqueous solution containing a bicarbonmate selected from the group consisting of, ammonium bicarbonate,

alkali metal bicarbonates and mixtures thereof to effect ammonia transfer from the organic extractant to said aqueous solu-



tion and separating the organic extractant from said aqueous solution.

4,038,299

2-SUBSTITUTED-5-OXO-5H-DIBENZO [A,D] -CYCLOHEPTENE ESTERS

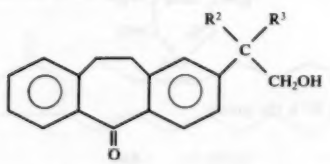
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 581,501, May 30, 1975, Pat. No. 3,966,820, which is a continuation-in-part of Ser. No. 486,038, July 5, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,779

Int. Cl.[2] C07C *69/02, 69/76*

U.S. Cl. 260—410.5 **25 Claims**

1. The pharmaceutically acceptable esters of a hydrocarbon carboxylic acid of from 1 to 12 carbon atoms and a compound selected from the group of compounds represented by the formula:


(I)

where one of R^2 and R^3 is hydrogen and the other is hydrogen, methyl, or ethyl, or together R^2 and R^3 are methylene; the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

4,038,300

POLYMERIZABLE ETHYLENICALLY UNSATURATED N-SUBSTITUTED 2,2-DIHYDRO CARBYL-2,1,3-BENZOSTANNA-THIAZOLINES

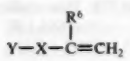
Hector Belmares-Sarabia, Cuernavaca, 745 Colonial La Pastora, Villa de Guadalupe, M. L., Mexico

Filed Aug. 23, 1974, Ser. No. 499,879

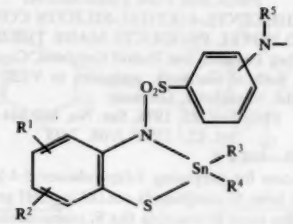
Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **9 Claims**

1. The ethylenically unsaturated organotin heterocyclic compounds of Formula I shown as follows:



Formula I, wherein



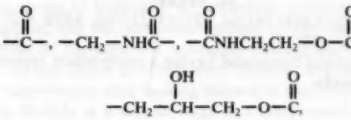
Y is

R^1 and R^2 are separately selected from the group consisting of hydrogen, halogen, lower carboalkoxy, lower alkoxy, and lower hydrocarbyl, the term "lower" referring to a group containing 1–4 carbon atoms unless otherwise indicated;

R^3 and R^4 are separately selected monovalent hydrocarbyl groups;

R^5 is a monovalent group selected from the group consisting of hydrogen and hydrocarbyl;

X is a bridging group selected from the group consisting of



R^6 is a monovalent group selected from the group consisting of hydrogen and methyl.

4,038,301

REMOVAL AND RECOVERY OF ORGANOLEAD COMPOUNDS FROM ACTIVATED CARBON AND RECOVERY OF THE ACTIVATED CARBON

Jack M. Otto, Beaumont, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 10, 1975, Ser. No. 630,839

Int. Cl.[2] C07F *7/24*

U.S. Cl. 260—437 R **7 Claims**

1. In a method of recovering organolead chloride compounds having the formula $PbR_{4-x}Cl_x$, where R is chosen from the group consisting of aryl groups and alkyl groups having from 1 to 8 carbon atoms and x is a number from 1 to 3, from an organolead chloride compound bearing aqueous solution containing from about 1 to about 20 parts per million of organolead chloride compounds, which method comprises passing the organolead chloride compound bearing aqueous solution through a bed of solid particle carbonaceous material, said carbonaceous material having a particle size range of 100 percent passing 8 mesh, substantially none passing 40 mesh, a surface area of from about 500 to about 1,600 square meters per gram, and a porosity of from about 0.80 to about 0.85, and withdrawing aqueous solution containing less than one part per million of organolead chloride compound, the improvement comprising passing the organolead chloride compound bearing aqueous solution through the bed of carbonaceous material until the carbonaceous material contains at least one weight percent organolead chloride compound, thereafter contacting the carbonaceous material with an aqueous extracting solution chosen from the group consisting of 0.1 to 5.0 normal solutions of HNO_3, N_2SO_4, $HClO_4$, $HMnO_4$, HCl, HBr, and HI, and recovering an aqueous solution containing in excess of 50 milligrams per liter of organolead chloride compounds.

4,038,302
PROCESS FOR PREPARING 2-(CYCLOHEXENYL-4-)ETHYL-SILICON COMPOUNDS AND NOVEL PRODUCTS MADE THEREBY

Sigrid Reichel, Dresden, and Rudolf Gottfried, Cossebaude near Dresden, both of Germany, assignors to VEB Chemiewerk Nuenchritz, Nuenchritz, Germany

Filed Feb. 23, 1976, Ser. No. 660,344

Int. Cl.² C07F *7/08, 7/18*

U.S. Cl. 260—448.2 E **7 Claims**

1. A process for preparing 2-(cyclohexenyl-4-)ethyl-silicon compounds from Si compounds containing SiH groups, which comprises the steps of reacting the Si compounds in the presence of hexachloroplatinic acid as addition catalyst with vinylcyclohexene-4 at normal pressure and at temperatures between 20° and 200° C.

4,038,303
QUATERNARY AMMONIUM CARBAMIDE COMPOUNDS

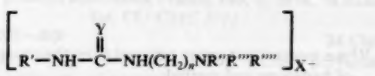
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 134,827, April 16, 1971, Pat. No. 3,956,479, which is a division of Ser. No. 712,968, March 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sept. 13, 1966, abandoned. This application Feb. 20, 1976, Ser. No. 659,623

Int. Cl.² C07C *141/04, 127/15, 157/05;* A61K *7/22*

U.S. Cl. 260—459 A **7 Claims**

1. A chemical compound having a composition represented by the formula:



where

R′ is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, an aryl group and an aryl group substituted by halogen;

R″ and R‴ are each independently an alkyl group containing 1 to 2 carbon atoms;

R⁗ is an alkyl group containing 10 to 18 carbon atoms;

Y is selected from the group consisting of oxygen and sulfur;

n is an integer 2 to 6; and

X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate.

4,038,304
URETHANE PREPOLYMER

Seiji Kazama, Kawanishi; Michio Tanaka, Takatsuki, and Katsuki Nagano, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

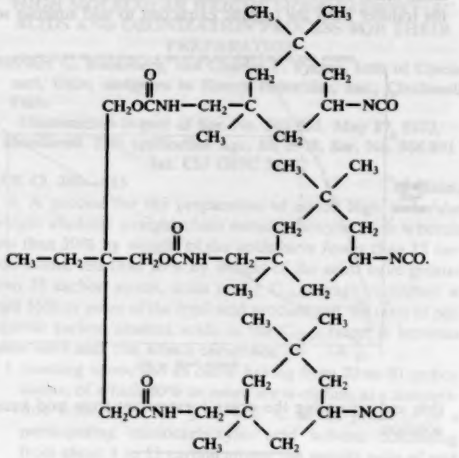
Filed May 9, 1975, Ser. No. 576,136

Claims priority, application Japan, May 20, 1974, 49-56978; Apr. 11, 1975, 50-44473

Int. Cl.² C07C *125/06*

U.S. Cl. 260—468 E **3 Claims**

1. A polyurethane prepolymer composition consisting essentially of (1) not less than a weight ratio of relative to the 0.65 weight of the whole composition of the idealized adduct prepared from reacting trimethylolpropane with 3 moles of 3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate, (2) not more than a weight ratio of 0.05 of 3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate relative to the weight of the whole composition and (3) the remainder being essentially the by-products formed from the reaction producing the idealized adduct (1); and wherein said idealized adduct has the formula:



4,038,305
CYCLOPENTENONE DERIVATIVES

Rune Eliasson, Vallingby, Sweden, and Poul Nedenskov, Birkerod, Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

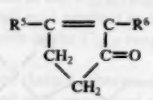
Continuation-in-part of Ser. No. 341,660, March 15, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,774

Claims priority, application United Kingdom, Mar. 20, 1972, 12941/72

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—468 K **2 Claims**

1. Cyclopentenone derivatives of the formula



(I)

wherein R^5 is the group

wherein each of R^2 and R^3 is an alkyl group of 1–8 carbon atoms, when R^6 is a group of the formula $-(CH_2)_6$-$COOR^1$, wherein R^1 is an alkyl group having 1–8 carbon atoms.

4,038,306
N-T-BUTOXYCARBONYL-S-LOWER ALKANOYLAMIDOMETHYL-CYSTEINE AND P-NITROPHENYL ESTERS

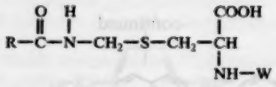
John D. Milkowski, Edison, N.J.; Daniel F. Veber, Ambler, and Ralph F. Hirschmann, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 384,532, Aug. 1, 1973, abandoned, which is a division of Ser. No. 57,883, June 17, 1970, Pat. No. 3,770,822, which is a division of Ser. No. 658,665, Aug. 7, 1967, Pat. No. 3,560,521. This application Sept. 23, 1975, Ser. No. 616,110

Int. Cl.² C07C *149/24, 149/243*

U.S. Cl. 260—479 S **3 Claims**

1. A compound of the formula



and p-nitrophenyl esters thereof, wherein R is lower alkyl, and W is t-butoxycarbonyl.

4,038,307

MANUFACTURE OF BUTENEDIOL DIACETATES

Hans-Martin Weitz, Frankenthal, and Juergen Hartig, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 28, 1975, Ser. No. 572,133
Claims priority, application Germany, May 3, 1974, 2421408
Int. Cl.[2] C07C 67/05
U.S. Cl. 260—497 A **3 Claims**

1. In an improved process for the manufacture of butenediol diacetates by reacting butadiene with oxygen and acetic acid over a solid catalyst which contains palladium and at least one of the elements selected from the group consisting of phosphorus, arsenic, antimony, bismuth, selenium and tellurium, the improvement which comprises carrying out the reaction in the gas phase in the presence of carbon monoxide.

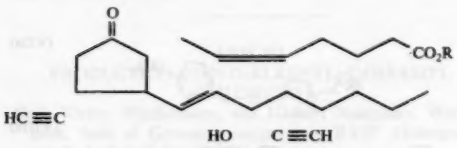
4,038,308

PROSTAGLANDIN DERIVATIVES

Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,458
Int. Cl.[2] C07C 177/00
U.S. Cl. 260—514 D **2 Claims**

1. A chemical compound of the structure:



wherein R is hydrogen, alkyl of from 1 to 6 carbon atoms, an alkali metal cation or a pharmacologically acceptable cation derived from ammonia or a basic amine.

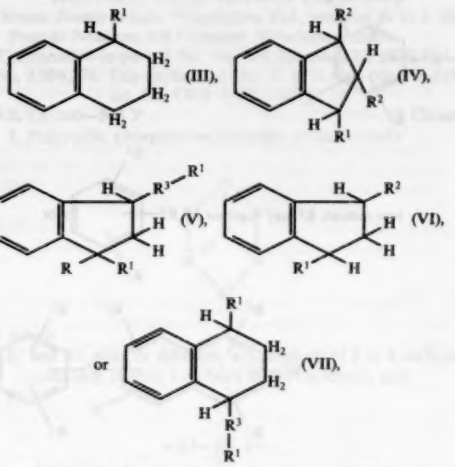
4,038,309

PRODUCTION OF 2-HYDROXYNAPHTHALENE-3-CARBOXYLIC ACID

Helmut Hoch, and Hans-Juergen Quadbeck-Seeger, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

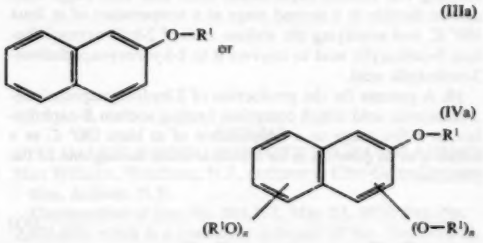
Division of Ser. No. 422,547, Dec. 6, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,524
Claims priority, application Germany, Feb. 12, 1972, 2260637
Int. Cl.[2] C07C 51/15
U.S. Cl. 260—520 A **18 Claims**

1. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution of suspension in a liquid araliphatic compound having one of the formulae

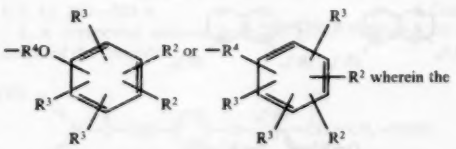


in which R^1 is phenyl or naphthyl, R^2 is alkyl of one to four carbon atoms or hydrogen, R^3 is alkylene of one to eight carbon atoms, and the phenylene groups of the compounds of formulae III through VII optionally bearing alkyl of one to three carbon atoms as substituents thereof, then reacting sodium naphtholate after heating thereof in said first stage with carbon dioxide in a second stage at a temperature of at least 180° C to form the sodium salt of 2-hydroxynaphthalene-3-carboxylic acid, and acidifying the latter compound to convert it into 2-hydroxy-naphthalene-3-carboxylic acid.

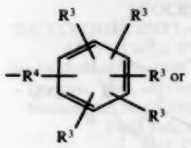
6. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

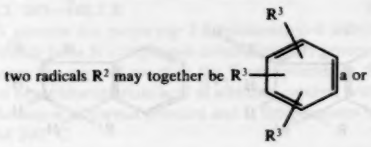


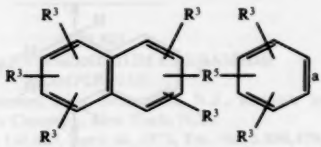
in which R^1 is alkyl of one to four carbon atoms, cyclopentyl, cyclohexyl, $—R^5—(OR^5)_n—CH_3$,



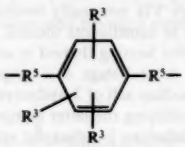
individual radicals R^2 and R^3 may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms, cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or $—(OR^5)_n—CH_3$, one radical R^2 may also be:







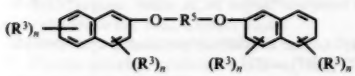
fused with the benzene nucleus at the side a in which R^3 has the above meanings, R^4 is alkylene of two to four carbon atoms or



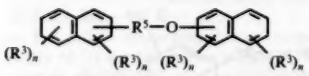
in which R^3 has the above meaning, R^5 is alkylene of two to four carbon atoms, R^6 is alkyl of one to four carbon atoms and n is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

10. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

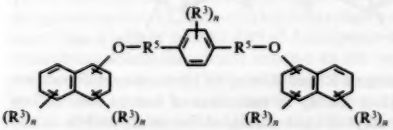
(Va)



(VIa)



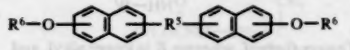
(IX)



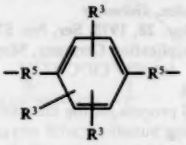
-continued

(XI)

or



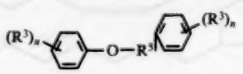
wherein the individual radical R^3 may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or $-(OR^5)_n-CH_3$, R^4 is alkylene of two to four carbon atoms or



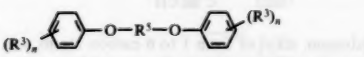
in which R^3 has the above meanings, R^5 is alkylene of two to four carbon atoms, R^6 is alkyl of one to four carbon aoms and n is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

14. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

(VIIa)

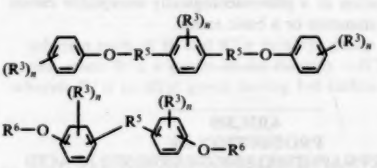


(VIIIa)



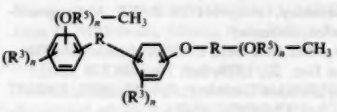
(X)

(XII)

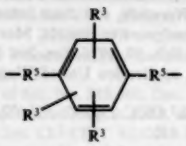


or

(XIII)



wherein the individual radical R^3 may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms, cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or $-(OR^5)_n-CH_3$, R^4 is alkylene of two to four carbon atoms or



in which R^3 has the above meanings, R^5 is alkylene of two to four carbon atoms, R^6 is alkyl of one to four carbon atoms and n is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

4,038,310

ACID ANHYDRIDE TO REACT WITH IMPURITIES IN THE PRODUCTION OF PERFLUOROCARBOXYLIC ACIDS

Geir Björnson, and Harold C. Walters, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1976, Ser. No. 666,092
Int. Cl.[2] C07C *53/18, 53/34*
U.S. Cl. 260—539 A **9 Claims**

1. In a process comprising contacting under reaction conditions an alkanoic carboxylic acid containing 2 to 10 carbon atoms per molecule, and a perfluorocarboxylic acid fluoride containing 2 to 10 carbon atoms per molecule from an electrochemical fluorination zone to give a perfluorocarboxylic acid and an acyl fluoride, the improvement comprising adding a small amount of an alkanoic acid anhydride to react with impurities, said impurities including at least one of HF, water, and carbonyl fluoride.

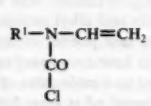
4,038,311

PRODUCTION OF N-(1-ALKENYL)-CARBAMYL CHLORIDES

Hans Kiefer, Wachenheim, and Herbert Naarmann, Wattenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

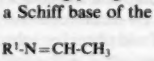
Continuation-in-part of Ser. No. 887,346, Dec. 22, 1969, abandoned. This application Dec. 16, 1974, Ser. No. 533,143
Claims priority, application Germany, Jan. 14, 1969, 1901542
Int. Cl.[2] C07C *125/03*
U.S. Cl. 260—544 C **7 Claims**

1. A process for the production of a compound of the formula



(I),

wherein R^1 is tert-butyl or tert-pentyl, which process comprises reacting phosgene at a temperature of −30° to +150° C. with a Schiff base of the formula



(II),

wherein r^1 has the same meaning given above, and in the presence of an additional base selected from the class consisting of tertiary amines and alkali metal carbonates.

4,038,312

TRICYCLIC PHOSPHOROUS TRIAMIDES

Thomas Joseph Atkins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

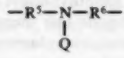
Continuation-in-part of Ser. No. 606,778, Aug. 22, 1975, Pat. No. 3,996,276. This application Oct. 7, 1976, Ser. No. 730,519
Int. Cl.[2] C07F *9/02, 9/65, 9/22*
U.S. Cl. 260—551 P **11 Claims**

1. Polycyclic phosphorous triamides of the formula

in which

R^1 and R^2, alike or different, are alkylene of 2 to 6 carbons containing at least 2 carbons in the backbone, and

R^5 is



—R^5—O—R^6—, or

—R^5—O—R^6—O—R^7— where

R^5, R^6 and R^7, alike or different, are alkylene of 2 to 6 carbons containing 2 to 3 carbons in the backbone, and Q is hydrogen or alkyl of 1 to 18 carbons.

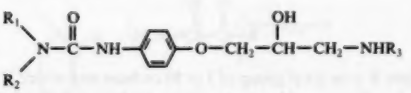
4,038,313

CYCLOALKYLUREIDO PHENOXY PROPANOLAMINES

Max Wilhelm, Watchung, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 361,373, May 17, 1973, Pat. No. 3,935,259, which is a continuation-in-part of Ser. No. 101,393, Dec. 24, 1970, abandoned. This application Dec. 11, 1975, Ser. No. 639,683
Claims priority, application Switzerland, Jan. 8, 1970, 204/70; Nov. 13, 1970, 16788/70
Int. Cl.[2] A61K *31/17*; C07C *127/19, 127/15*
U.S. Cl. 260—553 A **1 Claim**

1. A compound selected from the group consisting of an amine of the formula



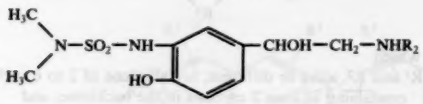
wherein R_1 denotes hydrogen, R_2 denotes cycloalkyl having 4 to 7 ring members and R_3 denotes lower alkyl and of therapeutically acceptable acid addition salts of such compounds.

4,038,314
1-HYDROXY-1-[(4'-HYDROXY-3'AMINOSULFONAMIDO)-PHENYL]-2-AMINO-ETHANES AND SALTS

Anton Mentrup, Ingelheim am Rhein; Kurt Schromm, Ingelheim am Rhein; Ernst-Otto Renth, Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 239,311, March 29, 1971, abandoned. This application Mar. 21, 1974, Ser. No. 453,438
Claims priority, application Germany, Apr. 1, 1971, 2115926
Int. Cl.[2] C07C *143/80;* A61K *31/18*
U.S. Cl. 260—556 N **5 Claims**

1. A racemic mixture of a compound of the formula



wherein R_2 is phenoxy-(alkyl of 3 carbon atoms), phenyl-(alkyl of 5 carbon atoms), or naphthyl-(alkyl of 5 carbon atoms); a diastereoisomeric antipode pair thereof; an optically active isomer thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture, antipode pair or optical isomer.

4,038,315
ISOLATION AND RECOVERY OF CALCIUM CHLORIDE COMPLEX OF 7-DIMETHYLAMINO-6-DIMETHYL L-6-DEOXYTETRACYCLINE HYDROCHLORIDE

Martin Tobkes, Spring Valley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 11, 1972, Ser. No. 252,175
Int. Cl.[2] C07F *3/04;* C07C *103/19*
U.S. Cl. 260—559 AT **1 Claim**

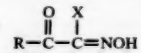
1. A calcium chloride complex of 7-dimethylamino-6-demethyl-6-deoxytetracycline hydrochloride of the formula: $(C_{23}H_{27}N_3O_7 \cdot HCl)_4 \cdot CaCl_2 \cdot nH_2O$, wherein *n* is an integer from 7 to 13, inclusive.

4,038,316
PREPARATION OF ACYLHYDROXIMYL HALIDES

Roger G. Duranleau, Ardonia, and John M. Larkin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,421, Dec. 12, 1974, Pat. No. 3,960,953. This application Dec. 8, 1975, Ser. No. 638,408
Int. Cl.[2] C07C *131/00*
U.S. Cl. 260—566 A **12 Claims**

1. An acylhydroximyl halide corresponding to the formula:



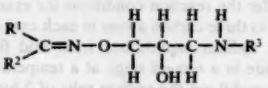
where R is an alkyl group of 3 to 50 carbons and where X is Cl, Br, I or F prepared by contacting a nitroketone with a halogen acid in the presence of a polar protic organic solvent selected from the group consisting of alkanoic acids of up to 16 carbon atoms and alkanols having from 2-16 carbon atoms.

4,038,317
O-AMINOALKYL OXIMES

Camille Georges Wermuth, and Jean Schwartz, both of Strasbourg, France, assignors to Seperic, Morat, Switzerland

Filed Feb. 10, 1976, Ser. No. 656,970
Claims priority, application United Kingdom, Feb. 12, 1975, 5956/75
Int. Cl.[2] C07C *131/00, 131/02, 131/08*
U.S. Cl. 260—566 AE **3 Claims**

1. A compound selected from the group consisting of compounds of formula : (I)



in which :

R^1 is selected from the group consisting of phenyl phenyl substituted by a radical selected from C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen, nitro, amino and cyano, and naphthyl,

R^2 is selected from the group consisting of hydrogen, C_1-C_4 alkyl, and phenyl, or together with the carbon atom to which they are attached, R^1 and R^2 form a polycyclic ring, selected from the rings derived from fluorene, xanthene, indane, tetrahydronaphthalene, dihydrodibenzocycloheptene and dibenzocycloheptene,

R^3 is selected from the group consisting of isopropyl and tert.butyl, and a pharmaceutically acceptable acid addition salt thereof.

4,038,318
IONENES

Wun Ten Tai, Palos Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed June 27, 1975, Ser. No. 590,882
Int. Cl.[2] C07C *91/38*
U.S. Cl. 260—567.6 P **7 Claims**

1. A novel ionene polymer prepared by the steps comprising:

A. Adding a lower aliphatic secondary amine containing 2–6 carbon atoms to a lower aliphatic aldehyde from the group consisting of formaldehyde and acetaldehyde in a mole ratio of from 2:1 to 1:2 to produce a secondary amine-aldehyde adduct,

B. Adding the adduct of Step A to a phenol compound selected from the group consisting of phenol, and mono, di and tri alkyl substituted phenols said alkyl groups containing from 1–15 carbon atoms, said phenol compound further characterized as having at least two reactive sites in the ortho and/or para position; in a mole ratio of aldehyde to phenol or substituted phenol of at least 2.0 with agitation at a temperature of from 10°–100° C for a period sufficient to allow a reaction; and then,

C. Adding to the product of Step B a chain extender selected from the group consisting of 1,4-dichlorobutene-2 and epihalohydrins in a mole ratio of said phenol or substituted phenol to chain extender of essentially 1 with agitation at a temperature of from 20°–70° C for a time sufficient to form an ionene polymer,

D. Recovering the ionene polymer.

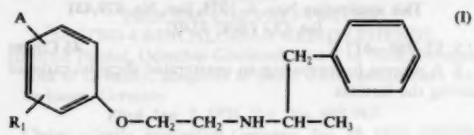
4,038,319

SUBSTITUTED PHENOXYALKYLAMINES, PROCESS FOR THEIR PREPARATION AND APPLICATIONS THEREOF

Henri Pinhas, Paris, France, assignor to Laboratoires Laroche Navarron, Levallois, France

Continuation-in-part of Ser. No. 210,560, Dec. 21, 1971, Pat. No. 3,843,725. This application May 3, 1974, Ser. No. 466,838
Int. Cl.[2] C07C *93/06*
U.S. Cl. 260—570.7 4 Claims

1. A compound selected from the group consisting of phenoxyalkylamines having the formula



in which R_1 is selected from the group consisting of hydrogen and methyl, and A is a cycloalkyl alkyl.

4,038,320

PHENYLETHYNYL SUBSTITUTED AROMATIC DIAMINES

Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,325
Int. Cl.[2] C07C *87/50*
U.S. Cl. 260—578 3 Claims

1. A compound selected from the group consisting of 2,2'-bis(phenylethynyl)-4,4'-diaminobiphenyl and 2,2'-bis(phenylethynyl)-5,5'-diaminobiphenyl.

4,038,321

PROCESS FOR PRODUCTION OF UNSYMMETRICAL DIMETHYLHYDRAZINE BY NITROSATION OF DIMETHYLAMINE AND HYDROGENATION OF THE NITROSO DIMETHYLAMINE TO THE DISTILLATION OF UNSYMMETRICAL DIMETHYLHYDRAZINE

Donald N. Thatcher, Hollister, and Yoshiyuki Arikawa, Gilroy, both of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Filed Jan. 12, 1976, Ser. No. 648,226
Int. Cl.[2] C07C *109/02, 111/00*
U.S. Cl. 260—583 B 13 Claims

1. A process for preparing unsymmetrical dimethylhydrazine by the catalytic hydrogenation of N-nitrosodimethylamine and recovering potassium nitrate as a by-product consisting essentially of the steps of:

A. nitrosating an aqueous solution of dimethylamine by reaction with dinitrogen tetraoxide and potassium carbonate at a pressure from atomospheric to 50 psi g and a temperature from −10° C to 40° C to produce an aqueous solution of N-nitrosodimethylamine and potassium nitrate and gaseous carbon dioxide; and,

B. extracting all of said potassium nitrate from said aqueous solution by a liquid extraction at a temperature between 0° C to 30° C wherein methylene chloride is added as an extractive solvent to said aqueous solution, and withdrawing an aqueous solution of said potassium nitrate and a separate potassium nitrate-free stream of N-nitrosodimethylamine in solution with methylene chloride; and,

C. hydrogenating the potassium nitrate-free stream of N-nitrosodimethylamine solution in the presence of a hydrogenation catalyst by reacting said stream with hydrogen at a pressure from 50–1000 psi g and at a temperature from 50°–90° C to produce an aqueous product solution containing unsymmetrical dimethylhydrazine; and

D. distilling said product solution in the presence of an organic distillation base selected from the group consisting of diethanolamine, morpholine, diethylaminoethanol and dimethylamino ethanol, and taking off unsymmetrical dimethylhydrazine as a heart cut substantially free of water, N-nitrosodimethylamine, and said distillation base.

4,038,322

PROCESS FOR THE OXIDATION OF PARAFFINS

Pierre M. J. G. de Radzitzky d'Ostrowick, 101 Avenue Paul Hymans, Woluwe-St-Lambert, Brussels; Jacques D. V. Hanotier, 36 Avenue Docteur Decroly-uccle., Brussels 18, and Joseph M. E. Vaerman, 28 Clos Fernand Tonnet, Jette-Brussels 9, all of Belgium

Division of Ser. No. 239,367, March 29, 1972, abandoned, which is a division of Ser. No. 844,616, , Pat. No. 3,758,557. This application Feb. 6, 1976, Ser. No. 655,997
Int. Cl.[2] C07C *45/02*
U.S. Cl. 260—597 R 7 Claims

1. Process for the selective oxidation of straight chain paraffin hydrocarbons having 3 to 60 carbon atoms into oxygenated products having the same number of carbon atoms comprising predominantly saturated ketones wherein the oxygenated function is predominantly located in the 2-position, comprising reacting said hydrocarbon in a liquid phase free of oxidizable solvent in an atmosphere comprising free oxygen with an oxidizing system consisting essentially of oxides and salts of a metal of variable valency of group II though VI and cobalt, the metal in said compound being in its higher valency state and having an oxidation-reduction potential of at least 0.99 volts, and an activator selected from the group consisting of boron trifluoride and strong stable organic and inorganic acids having a dissociation constant greater than $5 \cdot 10^{-3}$, selected from the group consisting of sulfuric, phosphoric, perchloric, dichloracetic, trichloracetic, trifluoracetic, and p-toluenesulfonic and mixtures thereof, at a temperature in the range of −20° C to +80° C.

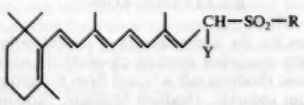
4,038,323

ALKENYL ARYL SULFONES

Pierre Chabardes, Lyon, and Marc Julia, Paris, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 254,103, May 17, 1972, Pat. No. 3,803,252. This application Sept. 26, 1973, Ser. No. 401,033
Claims priority, application France, May 19, 1971, 71.18168
Int. Cl.[2] C07C *147/08*
U.S. Cl. 260—607 AR 3 Claims

1. A retinyl-sulphone of the formula:



in which Y is hydrogen or retinyl, and R is alkyl, aryl, alkylaryl, or aralkyl.

4,038,324

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

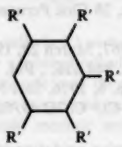
Continuation of Ser. No. 459,484, April 10, 1974, Pat. No. 3,891,713, which is a division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 21, 1975, Ser. No. 569,780

The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

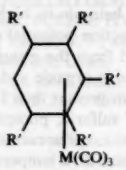
Int. Cl.[2] C07C *68/02*

U.S. Cl. 260—607 AR 7 Claims

1. The process of reacting an alkyl sulfonyl halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula $M(CO)_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula



wherein R′ is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, hydroxide, aryl and aryloxide groups having from 6 to about 12 carbon atoms including alkyl substituents, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield in arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an alkyl sulfonyl halide having the general formula $R—SO_2—X$ wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said alkyl sulfonyl halide with generation of a sulfonium ion from said alkyl sulfonyl halide so that said sulfonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

4,038,325

ISOMERIZATION OF CIS-ANETHOLE TO TRANS-ANETHOLE

Michael Martan, Skokie, and Paul H. Reichenbacher, Schaumburg, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 23, 1975, Ser. No. 625,290

Int. Cl.[2] C07C *41/00*

U.S. Cl. 260—612 D 4 Claims

1. A process for the isomerization of cis-anethole to trans-anethole which comprises treating cis-anethole with an inorganic or organic rhodium salt selected from the group consisting of rhodium chloride, rhodium bromide, rhodium iodide, rhodium nitrate, rhodium sulfate, rhodium formate, rhodium acetate, rhodium propionate, rhodium butyrate and rhodium acetylacetonate in an alcoholic medium at a temperature in the range of from about 25° C. to about 200° C. and a pressure in the range of from about atmospheric to about 100 atmospheres, and recovering the resultant isomerized anethole.

4,038,326

UNSATURATED ALICYCLIC CARBINOLS AND DICARBINOLS AND METHOD OF PREPARATION

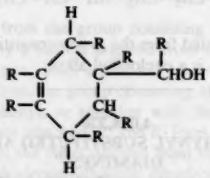
Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 344,468, March 23, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,431

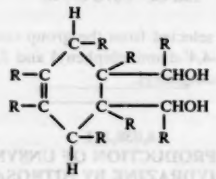
Int. Cl.[2] C07C *33/05*

U.S. Cl. 260—617 C 43 Claims

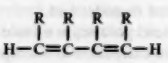
1. A process for preparing an unsaturated alicyclic carbinol having the formula



in which each R can be a hydrogen radical or a methyl radical and no more than 3 R's can be methyl radicals; or an unsaturated alicyclic dicarbinol having the formula



in which each R can be a hydrogen radical or a methyl radical and in which no more than 4 R's can be methyl radicals, or mixtures of said carbinol and said dicarbinol, which process comprises subjecting a polymeric oxidation product having peroxide functionally to an oxo reaction with carbon monoxide, hydrogen, and a metal carbonyl oxo catalyst under reaction conditions sufficient to yield a reaction mixture in which appreciably all of the peroxide functionality has been consumed, and then subjecting said reaction mixture to reducing conditions suitable for reducing carbonylic groups to hydroxyl groups so that no substantial detectable carbonylic groups remain, said reducing conditions further being such that the carbon-carbon double bond in said unsaturated alicyclic carbinol or dicarbinol is preserved, wherein said polymeric oxidation product is produced by the reaction of a conjugated diolefin of the formula



wherein each R is selected from the group consisting of a hydrogen radical and a methyl radical, and at least two of the R substituents of said conjugated diolefin are hydrogen radicals, with oxygen at a temperature in the range of 50° C. to 150° C. under a partial pressure of oxygen of at least 20 pounds per square inch gauge with the total pressure being sufficient to maintain said conjugated diolefin in the liquid phase for a period of time within the range of 0.1 to 25 hours.

4,038,327
3,5-DISUBSTITUTED-4-HYDROXYBENZYL DERIVATIVE

Gordon D. Brindell, Crystal Lake, and Rudy F. Macander, Cary, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 26, 1972, Ser. No. 257,178
Int. Cl.[2] C07C *37/00*
U.S. Cl. 260—619 R **1 Claim**

1. The composition which is 3,5-dibenzyl-4-hydroxybenzyl alochol.

4,038,328
PROCESS FOR PREPARING 2-NITRO-4,6-DICHLORO-5-METHYLPHENOL

Heinrich Pelster, Odenthal-Gloebusch, and Uwe Beck, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 2, 1976, Ser. No. 645,983
Claims priority, application Germany, Jan. 18, 1975, 2501899
Int. Cl.[2] C07C *79/32, 39/26*
U.S. Cl. 260—622 R **4 Claims**

1. In a process for preparing 2-nitro-4,6-dichloro-5-methylphenol by sulfonation of 4-chloro-5-methylphenol to form 2-sulfo-4-chloro-5-methylphenol followed by chlorination of the 2-sulfo-4-chloro-5-methylphenol to 2-sulfo-4,6-dichloro-5-methylphenol with subsequent reaction of the 2 -sulfo-4,6dichloro-5-methylphenol with nitric acid, the improvement which comprises carrying out the sulfonation at 40–100° C with concentrated sulfuric acid to form 2-sulfo-4-chloro-5-methylphenol, thereafter diluting the reaction mixture with water to sulfuric acid content of 20 to 30 percent, chlorinating the resulting 2-sulfo-4-chloro-5-methylphenol with chlorine at 45–60° C under a pressure of 1–3 bars gauge pressure to form 2-sulfo-4,6-dichloro-5-methylphenol.

4,038,329
PROCESS FOR PURIFICATION OF NEOPENTYL GLYCOL

Billy W. Palmer, and Howard N. Wright, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,759
Int. Cl.[2] C07C *29/24*
U.S. Cl. 260—637 P **20 Claims**

1. A process for the purification of crude neopentyl glycol produced by the alkali catalyzed condensation of formaldehyde and isobutyraldehyde consisting of the following steps:

A. extraction of crude neopentyl glycol with a hydroxylic organic solvent or mixture of solvents selected from the group consisting of alcohols and aliphatic and aromatic hydrocarbons having boiling points of between about 50° C. and about 150° C. which solvent or mixture of solvents has the property of being a solvent for neopentyl glycol and a nonsolvent for metal salts,

B. separating the neopentyl glycol/organic solvent extract into a solvent stream and a neopentyl glycol stream by distillation under atmospheric conditions,

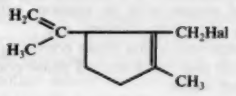
C. purifying the neopentyl glycol stream under atmospheric conditions.

4,038,330
1-METHYL-2-HALOGEROMETHYL-3-ISOPROPENYL-CYCLOPENT-1-ENES

Werner Hoffmann, Neuhofen, and Karl von Fraunberg, Bobenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 8, 1976, Ser. No. 665,064
Claims priority, application Germany, Mar. 29, 1975, 2513995
Int. Cl.[2] C07C *23/08*
U.S. Cl. 260—648 C **2 Claims**

1. Cyclopentene derivatives of the general formula I



I

where Hal is chlorine, bromine or iodine.

2. A process for the manufacture of a cyclopentane derivative as claimed in claim **1**, wherein 1-methyl-2-methylene-3-isopropenyl-cyclopentan-1-ol (II)

II

is reacted with a chlorinating, brominating or iodinating agent at from −50° to +100° C, said agent being selected from the group consisting of hydrogen chloride, hydrogen bromide, phosphorus trichloride, phosphorus pentachloride, thionyl chloride, phosphorus tribromide, phosphorus pentabromide, thionyl bromide, phosgene and hydrogen iodide.

4,038,331
CATALYTIC PROCESS FOR PREPARATION OF PERFLUOROALKYL SUBSTITUTED AROMATIC COMPOUNDS

John H. Tobin, Beacon Falls, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 549,589, Feb. 13, 1975, abandoned. This application Dec. 22, 1975, Ser. No. 643,227
Int. Cl.[2] C07C *25/14*
U.S. Cl. 260—651 F **9 Claims**

1. A process for preparing perfluoroalkyl substituted aromatic compounds which comprises:

A. heating together in the vapor phase under anhydrous conditions at a temperature of 300°–800° C

1. an aromatic hydrocarbon, said aromatic hydrocarbon being substituted with at least one atom of hydrogen and 0–3 further substituents selected from the group consisting of halogen, perhaloalkyl having 1–4 carbons, nitrile and combinations of such further substituents,
2. a perfluoroalkyl bromide having 1–16 carbon atoms, and
3. a catalytic amount of a catalyst selected from the group consisting of iodine and an iodine generating compound selected from the group consisting of perhaloalkyl iodine having 1–4 carbons; and

B. recovering said perfluoroalkyl substituted aromatic compound.

4,038,332
SEPARATION OF ETHYL FLUORIDE

C. O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1975, Ser. No. 621,097
Int. Cl.[2] C07C *19/08, 21/18, 21/20, 21/22*
U.S. Cl. 260—653 **5 Claims**

1. A process for separating ethyl-fluoride from an ethyl fluoride containing propane stream comprising

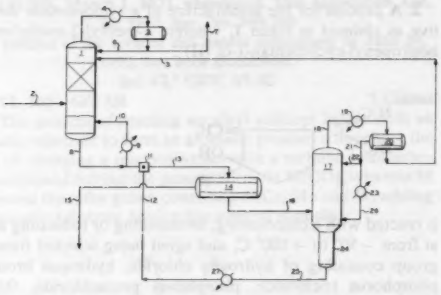
a. introducing said ethyl fluoride containing propane stream into an ethyl fluoride extraction zone,

b. introducing a dry liquid HF stream into said ethyl fluoride extraction zone to extract ethyl fluoride from said ethyl fluoride containing propane stream,

c. withdrawing a first stream comprising propane and being essentially free of ethyl fluoride from said ethyl fluoride extraction zone,

d. withdrawing a second stream comprising ethyl fluoride and HF from said ethyl fluoride extraction zone,
e. mixing said second stream with an aqueous extractant consisting esentially of to form mixture, and
f. separating said mixture into a first phase consisting essentially of ethyl fluoride and into a second phase consisting essentially of HF and water.

4. A method for separating ethyl fluoride from a first mixture consisting essentially of ethyl fluoride and HF, which comprises



a. contacting said first mixture with an aqueous extractant consisting essentially of water to produce a second mixture consisting essentially of ethyl fluoride, HF and said aqueous extractant and,
b. phase separating said second mixture into a first phase consisting essentially of ethyl fluoride, and into a second phase consisting essentially of HF and water.

4,038,333

TRICYCLI BREDT COMPOUND, TRICYCLO[5.3.1.0^{3,8}]UNDEC-2-ENE

Yoshiaki Inamoto; Yoshiaki Fujikura; Hiroshi Ikeda, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,704
Claims priority, application Japan, Apr. 28, 1975, 50-51700
Int. Cl.^{2} C07C *13/28*
U.S. Cl. 260—666 PY **3 Claims**

1. Tricyclo[5.3.1.0^{3,8}]undec-2-ene

4,038,334

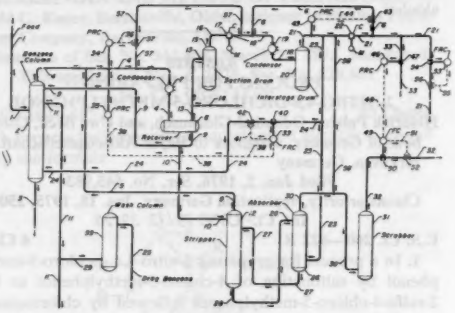
FRACTIONAL DISTILLATION PRESSURE CONTROL FOR SEPARATION OF AROMATIC ALKYLATION PRODUCT

Charles E. Wood, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed June 24, 1976, Ser. No. 699,747
Int. Cl.^{2} C07C *3/56, 15/09*
U.S. Cl. 260—671 R **11 Claims**

1. In a process for alkylating an aromatic hydrocarbon with a normally gaseous olefinic feed stream containing a normally gaseous paraffinic contaminant, in an alkylation reaction zone and in contact with an alkylation catalyst comprising a boron halide-modified refractory inorganic oxide, to produce an alkylated aromatic hydrocarbon, in which process (1) alkylation reaction product effluent is separated, in a fractional distillation column, to provide a first liquid-phase of an alkylated aromatic concentrate, containing poly-alkylated aromatics, and a first vapor-phase of an unreacted aromatic concentrate, containing boron halide and said paraffinic contaminant; (2) said first vaporous phase is separated, in a separation zone, to provide a second liquid-phase, unreacted aromatic concentrate and a second vapor-phase rich in paraffinic contaminant and boron halide; and, (3) a first portion of said second vapor-phase is returned to said distillation column, a second portion is recycled to said alkylation reaction zone, a third portion is treated, in a treating zone, to remove boron halide and at least a portion of the resulting paraffinic contaminant-rich vapors are withdrawn from the process, the method of controlling the fractional distillation column pressure which comprises the steps of:

a. sensing the pressure in said distillation column at a locus proximate to the withdrawal of said unreacted aromatic vapor-phase concentrate;
b. developing a first signal representative of said distillation column pressure;



c. adjusting the flow rate of the second portion of said second vapor phase being recycled to said alkylation reaction zone responsive to said first signal;
d. developing a second signal representing the flow rate of the recycled portion of said second vapor phase; and,
e. regulating the quantity of said paraffinic contaminant-rich vapors withdrawn from said process responsive to said second signal.

4,038,335

METHOD OF PREPARING BENZENE AND METHYLBENZENES

Khabib Minachevich Minachev, Leninsky prospekt, 57, kv. 15; Evgeny Sergeevich Mortikov, Leninsky prospekt, 61/1, kv. 34; Boris Mikhailovich Kozlov, Cherepovetskaya 22, kv. 22, all of Moscow; Alexandr Semenovich Leontiev, ulitsa Gagarina, 13, kv. 13, Bashkirskaya ASSR, Salavat; Nikolai Fedorovich Kononov, ulitsa Garibaldi 13/54, korpus 2, kv. 41, Moscow, and Sergei Markovich Lakiza, ulitsa Kolkhoznaya, 5, kv. 12, Bashkirskaya ASSR, Salavat, all of U.S.S.R.

Filed July 8, 1975, Ser. No. 593,947
Int. Cl.^{2} C07C *3/62*
U.S. Cl. 260—672 T **6 Claims**

1. A method of preparing benzene and methylbenzenes comprising contacting toluene at a temperature within the range of from 350° to 550° C. under a pressure of from 1 to 50 atmosphers with a granulated zeolite catalyst containing cations of metals of Group II of the periodic system with an exchange degree of from 5 to 30% of the theoretical value, hydrogen group with an exchange degree of from 6 to 22% of the theoretical value, and cations of metals of Group III of the periodic system with an exchange degree of from 20 to 80% of the theoretical value to form a reaction mixture I containing benzene and xylenes, separating benzene and xylenes from said reaction mixture I; contacting the separated xylenes with the same catalyst under the same conditions described above to form a reaction mixture II containing toluene and trimethylbenzenes, separating said toluene and trimethyl-benzenes from said reaction mixture II; contacting the separated trimethylbenzenes with the same catalyst under the same conditions described above to form a reaction mixture III containing xylenes and tetramethylbenzenes, and separating said xylenes and tetramethylbenzenes.

4,038,336

PURIFICATION OF UNSATURATED COMPOUNDS

Alfio J. Besozzi, and Alan W. Foster, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,046, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Oct. 30, 1975, Ser. No. 627,116

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 E 1 Claim

1. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

wherein the improvement comprises contacting said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds consisting of mixtures of oxides of Zr and Fe, and removing organic carbonyl compounds.

4,038,337

PROCESS FOR ISOMERIZING ALKENES

Giovanni Manara; Vittorio Fattore, and Bruno Notari, all of San Donato Milanese (Milan), Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Aug. 1, 1975, Ser. No. 601,208

Claims priority, application Italy, Aug. 2, 1974, 25943/74

Int. Cl.[2] C07C *5/22*

U.S. Cl. 260—683.2 21 Claims

1. A process for the skeleton isomerization of alkenes which comprises contacting an alkene having at least four carbon atoms or a mixture of alkenes having at least four carbon atoms with a catalyst consisting essentially of alumina previously treated with a silicon compound having the formula

wherein X, Y, Z and W are selected from the group of —R, —OR, —Cl, —Br, $-SiH_3$, —COOR, $-SiH_nCl_m$, R being either hydrogen or an alkyl, cycloalkyl, aromatic, alkyl-aromatic or alkyl-cycloalkyl radical having from 1 to 30 carbon atoms, n and m being whole numbers in the range of from 1 to 3.

4,038,338

NEW POLYEPOXIDE-POLYSILOXANE COMPOUNDS

Dieter Baumann, Birsfelden; Heinz Rembold, Arlesheim; Rolf Schmid, Gelterkinden, and Friedrich Lohse, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 299,537, Oct. 20, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 556,073

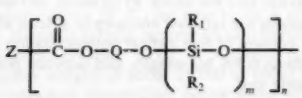
Claims priority, application Switzerland, Oct. 25, 1971, 15486/71

Int. Cl.[2] C08L *83/10*

U.S. Cl. 260—824 EP 10 Claims

1. Polyepoxide-polysiloxanes characterised in that they contain units of the formula I

(I)



in which Z denotes a n-valent radical of a polycarboxylic acid or of an acid polyester, Q denotes an aliphatic, cycloaliphatic, heterocyclic or aromatic epoxide-containing group in which the two oxygen atoms bonded to Q in the formula I are in adjacent positions to one another, R_1 and R_2 independently of one another denote an alkyl, alkenyl, aralkyl, aryl, cycloalkyl, alkoxy or aryloxy group or an epoxide-containing polysiloxane chain, *m* denotes a number greater than 1 and *n* denotes 2 or 3.

4,038,339

EPOXY-VINYL-POLYESTER COLD BLENDED RESIN COMPOSITION

Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1975, Ser. No. 613,841

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—835 8 Claims

1. The method of making a liquid resinous composition from a liquid-solid epoxy resin mixture, liquid Nadic methyl anhydride, a liquid unsaturated reactive vinyl monomer, a polyester, a reaction catalyst, and reaction inhibitor, said liquid composition having a long catalyzed shelf life, said method comprising: forming an unreacted admixture, at a temperature of between about 20° C to 35° C, consisting essentially of: (a) a mixture of 1 part of an epoxy resin combination, consisting of a liquid epoxy resin having an epoxy equivalent weight of between about 150 to 300 and a solid epoxy resin having an epoxy equivalent weight of between about 325 to 2,500, wherein the weight ratio of solid epoxy:liquid epoxy is between about 1:0.3 to 1:9, and about 0.4 to 1.4 parts of a liquid unsaturated reactive vinyl monomer, (b) about 0.3 to 0.7 part of liquid Nadic methyl anhydride, (c) about 0.2 to 1.0 part of a polyester resin for each 1 part of liquid unsaturated monomer, (d) an amount of a free radical reaction catalyst effective to promote a gelling effect to the resinous composition at temperatures over about 85° C and (e) an amount of a reaction inhibitor that is effective to react with the free radicals of the reaction catalyst to prevent reaction catalization of the polyester and the liquid unsaturated monomer at the admixing temperature of between about 20° C to 35° C, wherein the resinous composition has a viscosity of between about 50 cps to 2,500 cps at 25° C and is characterized by having an atmospheric catalyzed shelf life of at least 45 days at 25° C.

4,038,340

UNSATURATED POLYESTER RESINS WHICH HAVE RADICALS OF MONOHYDRIC ALCOHOLS AS TERMINAL GROUPS

Walter Frank; Karl Raichle; Otto Bendszus, and Manfred Patheiger, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 18, 1976, Ser. No. 697,418

Claims priority, application Germany, June 21, 1975, 2527675

Int. Cl.[2] C07C *69/44, 69/74, 69/80*

U.S. Cl. 260—861 1 Claim

1. Polyester resins which contain barrier agents and are based on

A. 60–90% by weight, based on the sum of components (A) and

(B), of α, β-ethylenically unsaturated polyesters and

B. 40–10% by weight, based on the sum of components (A) and (B), of copolymerisable monomers.

characterised in that the polyesters (A) contain, per mol of polycarboxylic acid radical, in addition to 0.65–0.95 mol of radicals of polyhydric alcohols, 0.30–0.70 mol of radicals of monohydric alcohols with 1–16 carbon atoms, 0.25–0.55 mol of which possess an aromatic and/or cycloaliphatic ring with 5–12 carbon atoms, and that the molar ratio of OH groups to COOH groups of the components of the polyesters (A) should be at least 0.9.

4,038,341

LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,751
Int. Cl.[2] C08L 67/06
U.S. Cl. 260—862 11 Claims

1. A polymerizable molding composition comprising:
1. a polymerizable polyester component; comprising an unsaturated polyester and a copolymerizable unsaturated monomer and
2. an additive component comprising the reaction product of a styrene-maleic anhydride copolymer, and a hydroxyl-terminated polydiene.

4,038,342

LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,752
Int. Cl.[2] C08L 67/06
U.S. Cl. 260—862 15 Claims

1. A polymerizable molding composition comprising
1. a polymerizable polyester compontent comprising an unsaturated polyester and a copolymerizable unsaturated monomer; and
2. an additive component comprising the reaction product of a styrene-maleic anhydride copolymer, and a saturated polyester, said saturated polyester generally being terminated with at least one hydroxyl group.

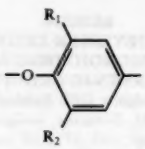
4,038,343

RESIN COMPOSITION CONTAINING COPOLYPHENYLENE ETHER

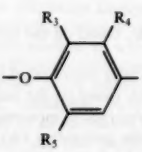
Eiichi Yonemitsu, Yokkaichi; Akitoshi Sugio, Ohmiya; Masanobu Masu, Kana; Takao Kawaki, and Yukio Sasaki, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,328
Claims priority, application Japan, Oct. 18, 1974, 49-119748
Int. Cl.[2] C08L 25/04, 33/04, 51/04, 53/02
U.S. Cl. 260—874 4 Claims

1. A thermoplastic blended resin composition comprising
1. 5 to 95% by weight of a copolyphenylene ether composed of 50 to 98 mole % of a structural unit of the formula



wherein R_1 and R_2 are identical or different and each represents methyl or ethyl, and 2 to 50 mole % of a structural unit of the formula



wherein R_3, R_4 and R_5 are identical or different and each represents methyl or ethyl, the total proportion of the two structural units being 100 mole % based on the copolymer, and
2. 5 to 95% by weight of at least one styrene resin selected from the group consisting of (A) a homopolymer of styrene monomer, α-methyl styrene monomer, vinyl toluene monomer or nucleus-chlorinated styrene monomer, (B) copolymer of at least two of said monomers and (C) a copolymer of one of said monomers with at least one member of olefins, acrylic compounds and conjugated dienes,
the total amount of components (1) and (2) being 100% by weight based on the total weight of the resin composition.

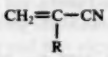
4,038,344

GRAFT COPOLYMERS OF OLEFINIC NITRILES AND OLEFINIC ESTERS ON DIENE RUBBERS

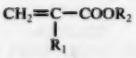
Allan A. Eisenbraun, and Edwin D. Hornbaker, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 100,358, Dec. 21, 1970, abandoned. This application Aug. 31, 1971, Ser. No. 176,715
Int. Cl.[2] C08F 293/00
U.S. Cl. 260—879 16 Claims

1. A process for the production of impact resistant polymers having low permeability to gases and vapors comprising polymerizing at a temperature of from about 0°–100° C in aqueous medium in the presence of an emulsifier and a free radical polymerization initiator in the substantial absence of molecular oxygen, 100 parts by weight of
A. at least 50 percent by weight of a compound having the structure



wherein R is a member selected from the group consisting of hydrogen and a lower alkyl group having from 1 to 4 carbon atoms, and
B. up to about 50 percent by weight based on the combined weight of (A) and (B) of an ester having the structure



wherein R_1 is a member selected from the group consisting of hydrogen and an alkyl group having from 1 to 4 carbon atoms and R_2 is an alkyl group having from 1 to 6 carbon atoms,
in the presence of from 8 to 15 parts by weight of
C. a homopolymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene.

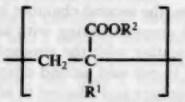
4,038,345

HIGH VISCOSITY CYANOACRYLATE ADHESIVE COMPOSITIONS, AND PROCESS FOR THEIR PREPARATION

Denis J. O'Sullivan, and Bernard J. Bolger, both of Dublin, Ireland, assignors to Loctite (Ireland), Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 403,375, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 212,717, Dec. 27, 1971, abandoned. This application July 2, 1975, Ser. No. 592,695
Int. Cl.[2] C08L 33/00
U.S. Cl. 260—881 10 Claims

1. The process for preparing an improved cyanoacrylate adhesive composition which comprises heating an acrylate polymer which has a reduced viscosity of substantially less than 5 and a content of free radical polymerization initiator of at least about 1% by weight, at a temperature of about 140° to about 180° centigrade and for about 30 to about 180 minutes and thereby increasing the reduced viscosity to at least about 5 and reducing the content of free radical polymerization initiator to less than about 0.5% by weight, said acrylate polymer having the repeating unit



wherein R^1 is hydrogen, ethyl or methyl and R^2 is a C_1 to C_4 alkyl or alkenyl group; and dissolving a quantity of the polymer so treated into a mixture of a monomeric ester of 2-cyanoacrylic acid and about 0.0005% to about 10% by weight of an inhibitor of anionic polymerization, the quantity of polymer being sufficient to produce a cyanocrylate adhesive composition with a viscosity between about 500 and about 20,000 centipoise.

4,038,346

TACKIFIER COMPOSITION AND RUBBER MIXTURE

George W Feeney, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 31, 1975, Ser. No. 564,006
Int. Cl.[2] C08F 4/14; C08L 9/00
U.S. Cl. 260—887 **9 Claims**

1. A modified tackifying resin composition prepared by mixing (A) about 75 to about 98 weight percent tackifying resin having a softening point in the range of about 80° C. to about 130° C. with, correspondingly, about 25 to about 2 weight percent oily polymer having a boiling point at atmospheric pressure in the range of about 190° C. to about 250° C.; where said tackifying resin is prepared by the step-wise method of (i) polymerizing at a temperature in the range of about 0° C. to about 50° C. in the presence of a catalyst selected from aluminum chloride and ethylaluminum dichloride, a monomer mixture comprised of (a) about 20 to about 80 weight percent piperylene, (b) about 80 to about 20 weight percent of a monoolefin containing 4 to 6 carbon atoms comprised of at least one olefin selected from the group consisting of 2-methyl-2-butene, 2-methyl-1-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (c) about 0 to about 30 weight percent of a monomer selected from the group consisting of dicyclopentadiene and α-methylstyrene and (ii) recovering the molten tackifying resin as a distilland from a steam distillation at a pot temperature in the range of about 255° C; and where said oily polymer is prepared by the step-wise method which comprises (iii) polymerizing at a temperature in the range of about 0° C. to about 50° C., in the presence of a catalyst selected from aluminum chloride and ethylaluminum dichloride, a monomer mixture comprised of (a) about 20 to about 80 weight percent piperylene, (b) about 80 to about 20 weight percent of a monoolefin containing 4 to 6 carbon atoms comprised of at least one olefin selected from the group consisting of 2-methyl-2-butene, 2-methyl-1-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (c) about 0 to about 30 weight percent of a monomer selected from the group consisting of dicyclopentadiene and α-methylstyrene and (iv) recovering said oily polymer as a distillation cut at a temperature in the range of about 190° C. to about 250° C. by distilling, optionally steam distilling, the product of (iii) to remove volatiles to a pot temperature in the range of about 235° C.

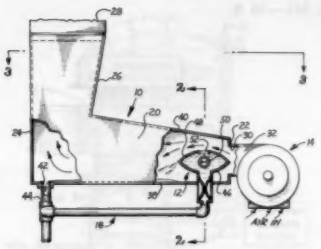
6. The modified tackifying resin composition of claim **1** in admixture with about 40 to about 60 parts by weight of a rubbery polymer per 50 parts by weight of said tackifying resin/oily polymer mixture, as an adhesive, where said rubbery polymer is selected from cis-1,4-polyisoprene rubber and unvulcanized elastomeric block copolymers having the general configuration A - B - A wherein each A is a nonelastomeric polymer block of styrene having an average molecular weight of about 2000 to about 100,000 and a glass transition temperature above about 25° C., the total block A content being about 10 to about 50 weight percent of said copolymer and B is an elastomeric polymer block of isoprene having an average molecular weight of about 25,000 to about one million and a glass transition temperature below about 10° C., said copolymer having a tensile strength at 25° C. in excess of about 200 pounds per square inch.

4,038,347

HUMIDIFYING APPARATUS

Thomas B. Mickley, 1810 172nd NE., Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 416,973, Nov. 19, 1973, abandoned. This application June 12, 1975, Ser. No. 586,275
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—30 **3 Claims**



1. An air humidifying apparatus comprising:

first means defining a humidification chamber having an air inlet, and air outlet, a water outlet, a bottom wall, a first end wall and an opposite end wall, said end walls attached to and extending upwardly in spaced relationship from said bottom wall, a pair of side walls attached to and extending upwardly in spaced relationship from said bottom wall and being affixed to said end walls, and a top wall spaced from said bottom wall and attached to said side walls and said end walls, said walls defining said chamber, said air outlet and said water outlet being located adjacent to opposite end wall of said chamber, said air inlet being located in said first end wall, said water outlet being associated with said bottom wall, said bottom wall being so constructed and oriented to support and direct water present thereon toward said water outlet,

fan means operatively associated with said first end wall and connected to said air inlet for discharging a stream of air into said chamber, said air inlet and said chamber being so constructed as to cause said stream of air to pass across said bottom wall and exhaust through said air outlet,

second means associated with said first means and defining a holding tank for water, said second means including a top wall having at least one aperture therein, said aperture being positioned in said chamber adjacent said air inlet, said second means having a water inlet and a water outlet, said second means being positioned and oriented within said chamber and being spaced from said bottom wall of said first means so that the stream of air discharged by said fan means is split by said holding tank, thereby causing a portion of the stream of air to pass over said holding tank and causing a portion of the stream of air to pass under said holding tank, said portions of said airstream being recombined at a location downstream from said holding tank,

third means for selectively supplying water to the water inlet of said second means when said fan means is operative, said third means providing a control signal only when supplying water to said second means,

heater means for heating the water in said second means to evaporate water therefrom, and

valve means associated with the water outlet of said second means, said valve means closing said water outlet responsive to said control signal provided by said third means and opening said water outlet in the absence of said signal provided by said third means to rapidly drain water from said holding tank and thereby entrain and remove sedi-

ment present in said holding tank after each humidification cycle.

4,038,348

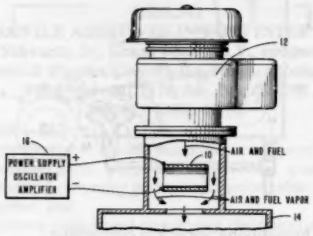
ULTRASONIC SYSTEM FOR IMPROVED COMBUSTION, EMISSION CONTROL AND FUEL ECONOMY ON INTERNAL COMBUSTION ENGINES

Harry W. Kompanek, 153 Rametto Road, Santa Barbara, Calif. 93108

Continuation-in-part of Ser. No. 344,534, March 26, 1973, abandoned. This application May 30, 1975, Ser. No. 582,205

Int. Cl.[2] F02M *27/08*

U.S. Cl. 261—36 A **17 Claims**



8. A novel system for providing a combustible air-fuel vapor mixture in an internal combustion engine comprising:

a. a cylindrical piezoelectric polycrystalline transducer of a length adapted to vibrate primarily in the hoop or radial mode, said transducer having inside and outside surfaces which are concentric cylinders,

b. electrical means for uniformly vibrating said surfaces of said transducer primarily in the hoop or radial mode at its resonant frequency, and

c. means for impinging a stream of liquid internal combustion engine fuel onto a vibrating cylindrical surface of said transducer at a rate whereby said fuel is immediately atomized or vaporized as it impinges and said transducer remains in an unloaded condition.

4,038,349

DEVICE FOR REDUCING TOXICITY OF I.C. CARBURETTOR ENGINE UNDER FORCED IDLING CONDITIONS

Arkady Solomonovich Ozersky, Festivalnaya ulitsa 31, kv. 139; Vladimir Fedorovich Kamenev, Petrovsko-Razumovsky proezd 15, kv. 85; Boris Alexeevich Kurov, Novo-Konjushenny pereulok, 3, kv. 11, all of, Moscow; Avenir Mikhailovich Gruzdev, ulitsa Michurina, 32, kv. 45, and Erlen Manuilovich Rubin, ulitsa Michurina, 32, kv. 22 both of, Zavolzhie Gorkovskoi oblasti, all of U.S.S.R.

Filed Dec. 22, 1975, Ser. No. 643,384

Int. Cl.[2] F02M *3/04*

U.S. Cl. 261—41 D **2 Claims**

1. Apparatus for reducing the toxicity of the exhaust from I.C. carburetor-fed engines under forced idling conditions, comprising: a carburetor having an idling system including outlet channels; an economizer adapted to cut off the flow of fuel through said channels during deceleration and installed on the carburetor; an inlet manifold and a pressure regulator installed thereon comprising a body mounting a spring-loaded valve adapted to vent said inlet manifold to the atmosphere, said spring-loaded valve being installed in said regulator body so that it forms, together with its inner surface and seat, an adjacent circular gap communicating with said economizer; two movable partitions mounted in said pressure regulator, each connected with said valve and body and forming, together with the inner surface of said body, three consecutively arranged variable-volume chambers, one of which accommodates said valve spring and communicates with the carburetor space downstream of the throttle in the zone of the lower edge of the closed throttle at the side opposite to said outlet channels of the idling system, the second chamber located between said movable partitions communicating with said circular gap and the third communicating with the atmosphere; and a pressure corrector adapted to put said second chamber in communication with the atmosphere and adapted to adjust pressure in said second chamber in accordance with engine speed.

4,038,350

METHOD OF PRODUCING INTEGRAL NON-FOAMED SKIN LAYER SHAPED ARTICLES

Geoffrey Sanderson Jaques, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 10, 1975, Ser. No. 540,274

Claims priority, application United Kingdom, Jan. 10, 1974, 1190/74

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—22 **20 Claims**

1. A method for the production of a shaped article which comprises forming a foamable mixture of a photopolymerisable ethylenically unsaturated material and a foaming agent in a mould, subjecting at least a part of the surface of the mixture in the mould to radiation of a wavelength such that photopolymerisation of the ethylenically unsaturated material occurs at said part of the surface to form a non-foamed and non-foamable skin layer and subsequently foaming the foamable mixture and polymerising the ethylenicaly unsaturated material in the foam.

4,038,351

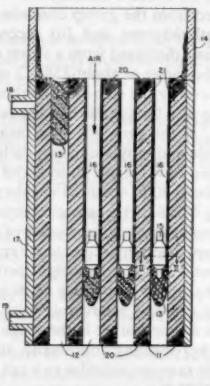
METHOD OF CASTING TUBULAR POLYSULFONE ULTRAFILTRATION MEMBRANES IN SAND MODULES

John W. Koenst, Jr., and Edward Mitchell, both of Pittsburgh, Pa., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,506

Int. Cl.[2] B29C *23/00*; B29D *7/10, 27/04*

U.S. Cl. 264—45.1 **17 Claims**



1. A method of casting unitary, tubular ultrafiltration membranes in place in the feed bores of an open pore module made of filler particles bonded by a thermosetting resin, said method comprising the steps of:

1. placing said module in a stationary vertical position,

2. placing a casting composition into each of the bores within the module; said composition, containing a combination dispersion-solution of 10 parts of polysulfone resin having a moisture content of up to about 0.15 wt.% in about 10–40 parts of a polar organic solvent, formed by mixing polysulfone resin and solvent in a low humidity atmosphere of up to about 50% relative humidity for about 24 to 192 hours to form a substantially homogeneous combination dispersion-solution having a viscosity of between

about 2,000–80,000 cp at 25° C and containing about 30–70 wt.% undissolved polysulfone resin,

3. gravity dropping a casting bob having a hydraulically stable geometry and a circular cross-section at its widest point down through the bore containing the casting composition at a speed less than 1 inch/second to form a continuous film of casting composition on the inside of each bore, said bore having an inside diameter between about 0.02 and 0.12 inches greater than the diameter of the bob at its widest point, introducing vapors of an organic solvent other than said polar organic solvent into said bores during the formation of said film on the inside of each of said bores to maintain a low humidity atmosphere of up to about 50% relative humidity in contact with the cast in place film during casting in the bores, and then

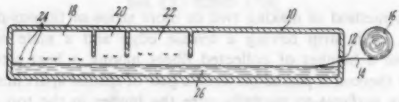
4. allowing air to contact the film followed by contacting the film with a leaching liquid selected from the group consisting of water, water organic and water inorganic effective to leach solvent from the film to form a membrane on the inside of each module bore.

4,038,352

METHOD FOR PRODUCING SHEETS OF SMALL UNIFORM THICKNESS

Francois Maurice Hennequin, Kernascleden, 56540 Le Croisty, France

Continuation-in-part of Ser. No. 390,247, Aug. 21, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,886
Claims priority, application France, Aug. 21, 1972, 72.29810
Int. Cl.² B29D *7/02*
U.S. Cl. 264—81 **14 Claims**



1. A method of producing solid films of materials capable of being vaporized and transformed directly from the vapor state to the solid state, said method comprising:

emitting the material, selected from the group consisting of metal material, metal oxide material and glass material, of which a film is to be formed or the constituents of such material in the vapor state under a vacuum of from 10^{-3} to 10^{-5} torr;

condensing the vapor to the solid state in the form of a film on the surface of a liquid bath maintained at a temperature appropriate for the controlled condensation of the vapor into solid without uncontrolled condensation at positions other than on the liquid bath, said liquid bath being of a material having a vapor pressure which is low in relation to the pressure of the surrounding atmosphere, said material of said liquid bath being non-reactive with the material of the film or of said surrounding atmosphere, and said material of said bath having a viscosity maintained lower than 1 Poise; and

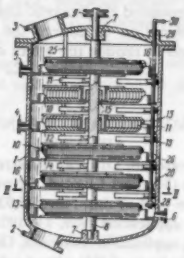
separating the thus condensed film from said surface of said liquid bath.

4,038,353

ROTOR FILM COLUMN FOR MAKING CONTACT BETWEEN GAS AND LIQUID

Alexandr Vladimirovich Shafranovsky, Molodezhnaya ulitsa, 4, kv. 7, Moskovskaya oblast, Balashikha; Viktor Markovich Olevsky, Leningradsky prospekt, 75a, kv. 91, Moscow; Vladimir Kazimirovich Chubukov, Komsomolsky prospekt, 41, kv. 97, Moscow, and Jury Alexandrovich Baskov, Shosse Entuziastov, 156, kv. 20, Moscow, all of U.S.S.R.

Filed Aug. 11, 1976, Ser. No. 713,278
Int. Cl.² B01D *47/16*
U.S. Cl. 261—89 **9 Claims**



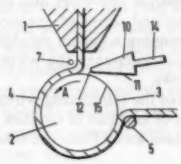
1. A rotor film column for making contact between a gas and a liquid comprising in combination; a housing; branch pipes for feeding the gas into the bottom part of said housing and for removing the gas from the top part of said housing; branch pipes for feeding the liquid into said housing and for removing the liquid therefrom; a vertical shaft rotatably mounted in said housing; contact stages secured on said shaft at a certain distance one above another; bands forming said contact stages, said bands being bent in the form of spirals diverging from said shaft; edges of said bands flanged towards said shaft; corrugations on said bands arranged substantially across these bands; annular pockets for collecting the liquid thrown down from said contact stages, said pockets being secured on the inner wall of said housing; overflow trays arranged in the space between said contact stages; receiving ends of said overflow trays communicating with said annular pockets for collecting the liquid flowing from the contact stages located above said overflow trays; discharge ends of said overflow trays located above the contact stages underlying these overflow trays.

4,038,354

PROCESS FOR EXTRUDING AND QUENCHING A POLYMERIC FILM

Timothy Alan Remmington, Hertford, England, and William Robinson, Dumfries, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed July 28, 1975, Ser. No. 599,349
Claims priority, application United Kingdom, Aug. 7, 1974, 34781/74
Int. Cl.² B29F *3/02*
U.S. Cl. 264—102 **8 Claims**



1. A process for extruding and quenching a polymeric film, which comprises extruding a molten polymeric film on to an

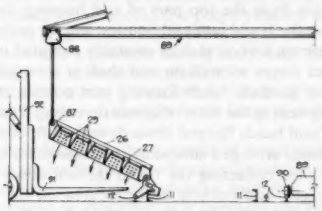
electrically earthed moving casting surface, said casting surface moving at a linear speed greater than the speed at which bubbles can be prevented from being entrapped between the molten polymeric film and the casting surface when electrostatic pinning is employed alone, depositing electrostatic charges upon part or the whole of the molten film width by means of an electrostatic pinning electrode supported in spaced relation to the molten film in the proximity of or prior to the region of first contact of the film with the casting surface, and applying suction to the space bounded by the path of the molten film prior to its first contact with the casting surface and that part of the moving casting surface prior to the region of first contact with the molten film, shortening the path of the molten film, the deposited electrostatic charges and the suction operating in combination to adhere the molten film to the casting surface, and to reduce the effect of neck-in.

4,038,355

PRODUCTION METHOD AND MEANS FOR CONCRETE ARTICLES

Robert Lyndon Bratchell, Ottoway, Australia, assignor to Concrete Industries (Monier) Limited, Ottoway, Australia

Continuation-in-part of Ser. No. 295,938, Oct. 10, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,934
Claims priority, application Australia, Oct. 27, 1971, 6810/71
The portion of the term of this patent subsequent to July 26, 1994, has been disclaimed.
Int. Cl.[2] B28B *23/04*
U.S. Cl. 264—157 **6 Claims**



1. A method of moulding concrete ties which comprises the steps:

positioning a plurality of mould frames on a longitudinally extending base frame, each mould frame comprising an open ended multicavity mould, the cavities of which are of shape for the forming of the concrete ties, and having thereon engaging members which engage the sides of the base frame and thereby align corresponding cavities of the mould frames,

positioning the lowermost of a first series of transversely extending spacers between adjacent ends of some of the axially adjacent moulds,

positioning a series of reinforcing wires in the aligned cavities in parallel spaced relationship with one another and on said lowermost of the series of spacers,

positioning the remainder of the first series of spacers also between adjacent ends of the said some of the adjacent moulds and in a horizontal direction between the reinforcing wires to separate the wires into horizontal rows, and positioning a second series of spacers between adjacent ends of the remaining adjacent moulds by movement in a vertical direction to engage the wires and separate them into vertical rows,

securing the ends of the reinforcing wires to anchor means at respective ends of said line of cavities, and moving one of said anchor means away from the other to thereby strain said wires,

mixing Portland cement, aggregate, sand and water to form a wet mix of concrete,

transporting the wet mix of concrete over the moulds while simultaneously discharging said concrete into the moulds to thus fill the moulds and surround the reinforcing wires with concrete,

removing the spacers after the concrete has set but before it cures,

allowing the concrete to cure, and then releasing the tension on the wires,

severing the reinforcing wires between adjacent said moulds,

coupling a tilt frame to one side of one of said mould frames and a corresponding side of said base frame while the mould frames remain on the base frame, said tilt frame comprising pivot means having a longitudinal axis,

lifting the other side of said mould frame to thereby pivot the mould frame about said longitudinal axis and then lowering the mould frame to invert it beyond said base frame side, and

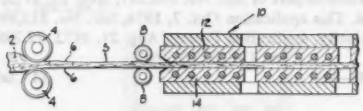
discharging said ties from the inverted moulds.

4,038,356

METHOD AND APPARATUS FOR MAKING A FIBROUS BOARD-LIKE PRODUCT HAVING A MALE EDGE AND A FEMALE EDGE

Robert Louis Beranek, Jr., Joshua, and Donny Lee Timms, Cleburne, both of Tex., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 14, 1976, Ser. No. 676,775
Int. Cl.[2] B29D *3/02*; B29G *5/00*
U.S. Cl. 264—150 **3 Claims**



1. A method of making two or more strips of fibrous duct board, each strip having a female edge and a male edge wherein a blanket of collected fibers having a heat setting binder thereon is passed between a pair of spaced apart heated moving surfaces to partially cure the binder in the top and bottom surface portions of the blanket, said blanket is then passed between opposed heated first and second platens spaced apart less than the thickness of said blanket to shape the blanket and cure the binder in said blanket, a first platen having a shoe spaced between its side edges and running along the length of the platen to form a flat valley depression along the length of said blanket, the portion of the blanket lying below the flat valley having a higher density than the blanket adjacent said valley, the second platen having a male edge forming die running along its length at or near each side edge of the platen to form a male edge along each outer edge portion of said blanket, and separating said blanket longitudinally in said flat valley depression to form said strip; the improvement comprising:

forming the portion of said blanket between the shoe and the opposite platen to essentially its final thickness in the upstream portion of said platens and gradually reducing the thickness of those portions of the blanket adjacent said shoe as said blanket is moved along between said first and second platens, said final thickness of the blanket in said adjacent portions being formed only in the downstream end portion of said platens.

4,038,357

MANUFACTURE OF SYNTHETIC FILAMENTS

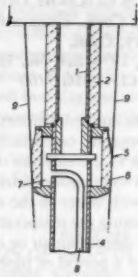
Bryan Boyes, and Alan Jones, both of Harrogate, England, assignors to Imperial Chemical Industries Inc., London, England

Continuation of Ser. No. 373,315, June 25, 1973, abandoned. This application July 10, 1975, Ser. No. 594,933

Claims priority, application United Kingdom, June 28, 1972, 30255/72

Int. Cl.[2] D01D *5/22*

U.S. Cl. 264—168 10 Claims



1. A method for the manufacture of potentially crimpable, synthetic linear polymer filaments which comprises the steps of (A) melt spinning a plurality of filaments, (B) initially partially cooling the hot filaments evenly with a stream of radial outflowing quence gas over a distance commencing from the spinneret and extending 3 to 10 inches below it, and (C) asymmetrically cooling the filaments further by causing them to contact a continuously renewed thin film of liquid less than the thickness of the filaments which liquid is at a temperature effectively below that of the filaments after step (B), the filaments contacting the film of cooler liquid in such manner that one side only of each filament contacts the film of liquid.

4,038,358

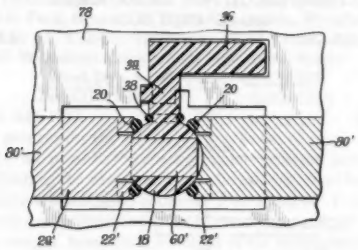
METHOD OF MAKING A VALVE

Thomas J. Wrasman, 12500 Ridge Road, Louisville, Ky. 40223

Filed Nov. 25, 1975, Ser. No. 635,256

Int. Cl.[2] B29D *3/00*

U.S. Cl. 264—242 9 Claims



1. A process for molding an integral housing about a preformed valve component to form a completed valve comprising the steps of;

providing a preformed valve component having a passageway therethrough and a preformed annular elastomeric seal adapted for sealable engagement with said preformed valve component;

securing said seal firmly against said preformed valve component with a seal tool having a plurality of spaced fingers for applying pressure at a plurality of spaced locations around the circumference of said seal;

providing blocking means for substantially blocking said passageway against the entrance of molten plastic during molding;

providing core means for forming inlet and outlet bores on each side of said valve component;

inserting said valve component, seal means, seal tool, blocking means and core means into a mold having relieved surfaces corresponding to the desired exterior shape of the housing;

molding said housing with a suitable plastic material about said valve component, seal means, seal tool, blocking means and core means during which time said fingers firmly hold said sealing means against said component;

removing said seal tool, blocking means and core means after the plastic housing is hardened, and removing the completed valve from said mold, said plastic material between said spaced fingers holding said sealing means intimately against said component after said tool has been removed.

4,038,359

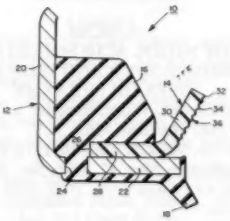
METHOD OF MAKING A SHAFT SEAL WITH DUAL LIP

Darrell D. Pendleton, Gastonia, N.C., assignor to Garlock Inc., Rochester, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,303

Int. Cl.[2] B29D *3/00;* B29H *3/00*

U.S. Cl. 264—263 9 Claims



1. A method for making a shaft seal of the type including a single annular metal case having a radial flange and a cylindrical portion, and an annular polytetrafluoroethylene sealing element including a radial portion and a sealing lip, said method comprising the steps of:

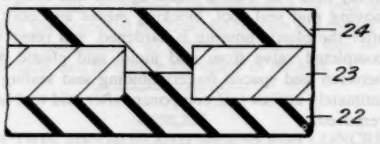
a. connecting said sealing element to said case by placing said radial portion of said sealing element against the inside surface of said radial flange of said case and molding an annular synthetic rubber filler ring in the annular space between said radial portion of said sealing element and said cylindrical portion of said metal case, said filler ring being a solid body substantially filling said annular space and being spaced away from and out of contact with said sealing lip, and bonding said filler ring to both said radial portion of said sealing element and to said cylindrical portion of said case; and

b. molding an auxiliary lip from said synthetic rubber simultaneously with said filler ring molding step, said auxiliary lip being located on the opposite side of said radial flange from said sealing lip.

4,038,360
METHOD FOR CONTOURING THE SURFACE OF THERMOPLASTIC SYNTHETIC RESINS

Friedrich Hanstein, Gross-Zimmern, and Theodor Peter Moench, Griessheim near Darmstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Oct. 1, 1976, Ser. No. 728,543
Claims priority, application Germany, Nov. 28, 1975, 2553573
Int. Cl.[2] B29C 17/00; B29F 5/00
U.S. Cl. 264—293 4 Claims



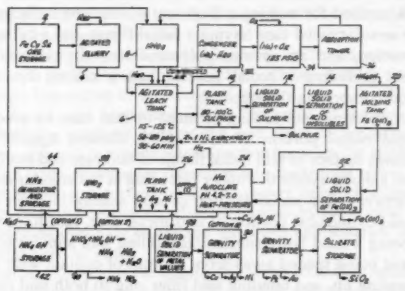
1. The method for contouring the surface of a thermoplastic synthetic resin sheet, comprising:

disposing said sheet, softened by heat, in contact with an embossing sheet and adjacent at least one perforation between opposite major surfaces of said embossing sheet with a resilient backing sheet on a side of said embossing sheet opposite said thermoplastic sheet, thereby forming an assembly of said sheets, said resilient backing sheet being capable of being deformed so that portions thereof will flow under pressure into said at least one perforation; applying pressure to said assembly, against said thermoplastic and said backing sheets, causing portions of said thermoplastic sheet and said resilient backing sheet to flow into said perforation and make mutual contact therein across substantially the entire area of said at least one perforation; cooling said thermoplastic sheet below the softening temperature thereof and separating said thermoplastic sheet from said embossing sheet and said resilient backing sheet.

4,038,361
RECOVERY OF NITRIC ACID SOLUBLE TRANSITION METALS FROM SULFUR AND IRON CONTAINING ORES OF THE SAME

John G. Posel, Everett, Wash., assignor to International Ore Technology, Inc., Highland Mills, N.Y.

Division of Ser. No. 569,228, April 18, 1975, Pat. No. 3,965,239. This application Mar. 17, 1976, Ser. No. 667,879
Int. Cl.[2] C01G 3/00, 5/00, 9/00, 7/00
U.S. Cl. 423—34 16 Claims



1. A method of recovering one or more metal values of the group consisting of copper, silver, nickel, cobalt and zinc from a sulfur and iron containing ore of the metal or metals, comprising intermixing the ore and at least a stoichiometric amount of nitric acid of about 30–50% by volume concentration to form an aqueous acid leach solution of the same, heating the solution to a temperature at or above the melting point of sulfur while the solution is contained under pressure in a relatively inert atmosphere, controlling the temperature of the solution to substantially precipitate the iron values from the solution, relatively separating the iron precipitate from the acid soluble phase of the lution, and recovering the metal value or values from the acid soluble phase.

4,038,362
INCREASING THE RECOVERABILITY OF GOLD FROM CARBONACEOUS GOLD-BEARING ORES

Wilbur J. Guay, Newtown, Conn., assignor to Newmont Explorations Limited, Danbury, Conn.

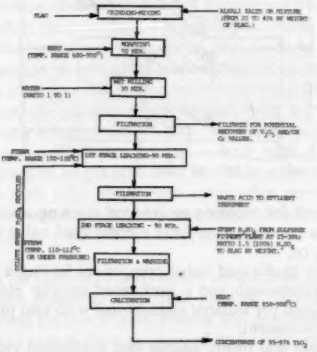
Filed Nov. 4, 1976, Ser. No. 738,868
Int. Cl.[2] C01G 7/00
U.S. Cl. 423—40 3 Claims

1. The method for treating sedimentary gold-bearing ore containing indigenous organic carbonaceous material and gold-bearing sulfides so as to increase the recoverability of its gold content by standard cyanidation extraction which comprises: slurrying the ore with water in the absence of extraneous alkaline material; adjusting the temperature of the slurry to about 167° to 212° F, and dispersing air or oxygen throughout the slurry at a rate and for a period of time such as the slurry will continue to absorb oxygen as the oxygen reacts with the organic carbonaceous components and the sulfice content of the ore; adjusting the temperature of the slurry to about 70° to 85° F, and dispersing chlorine gas throughout the slurry at a rate and for a period of time such as the slurry will continue to absorb the chlorine with evolution of carbon dioxide, nitrogen, and oxygen, as the chlorine reacts with the organic carbonaceous components of the ore and only until a significant amount of chlorine gas is liberated from the chlorinated slurry; and maintaining the thus chlorinated slurry at a temperature within the range of about 70° to 85° F for a period of about 6 to 12 hours with the resulting production of a slurry-solids content in which the gold component is amenable to at least 75 weight percent extraction by standard cyanidation practice.

4,038,363
UPGRADING SORELSLAG FOR PRODUCTION OF SYNTHETIC RUTILE

Basil Jarish, St. Lambert, Canada, assignor to Quebec Iron & Titanium Corporation-Fer et Titane due Quebec, Inc., Sorel, Canada

Filed Oct. 21, 1975, Ser. No. 624,458
Int. Cl.[2] C01G 23/04
U.S. Cl. 423—82 6 Claims



4. A process for recovering titanium, as TiO_2, and other values from Sorelslag the steps comprising:

a. admixing Sorelslag with an alkali metal salt or mixtures

thereof in a weight ratio of 0.3:1 to 0.6:1 salt to slag and roasting the same at a temperature from 600° to 950° C for 1 to 4 hours;

b. wet milling said slag and filtering the same including removing from filtrate vanadium and chromium values;

c. leaching countercurrently in a first stage said slag with sulfuric acid leaching liquor, said leaching liquor being introduced from a subsequent leaching stage said leaching liquor being at a concentration of less than about 15% H_2SO_4;

d. separating the spent leaching liquor from said first stage leached slag;

e. leaching in at least one additional stage said slag with a leaching liquor which is a sulphuric acid leaching liquor wherein the concentration of sulphuric acid in said leaching liquor is about 25 to 30%;

f. filtering said leached slag and returning the spent leaching liquor to a preceeding stage for leaching of said slag in said first stage; and

g. calcining said leached slag to obtain a TiO_2 concentrate having at least 94% TiO_2 present.

4,038,364

REDUCTION OF IRON IN TITANIUM ORE

Günter Lailach, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 30, 1974, Ser. No. 537,622
Claims priority, application Germany, Jan. 25, 1974, 2403458
Int. Cl.[2] C01G *23/04, 23/08;* B01D *11/02*
U.S. Cl. 423—86 12 Claims

1. In the production of synthetic rutile from a titanium and iron-containing ore by reducing most of the iron (III) in said ore into iron (II) with a steam-containing gaseous reducing agent at a temperature of about 850° to 1100° C, followed by leaching to remove the iron (II) and iron (III) and drying of the residue, the improvement which comprises using as said reducing agent hydrogen optionally containing CO, the gas in addition optionally containing CO_2, the molar ratio of the H_2 + any CO present: H_2O + any CO_2 present ranging between 0.36 and 1.8. whereby substantially no metallic iron is produced during reduction and substantially no hydrogen is produced during leaching.

4,038,365

REMOVAL OF LOW LEVEL HARDNESS IMPURITIES FROM BRINE FEED TO CHLORINE CELLS

Arvind S. Patil, Grosse Ile; Shyam D. Argade, Woodhaven, and Stephen M. Collins, Riverview, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 3, 1975, Ser. No. 637,328
Int. Cl.[2] C01F *11/18, 5/22;* C25B *1/16*
U.S. Cl. 423—161 9 Claims

1. A process for the subsequent treatment of conventionally treated brine prior to the electrolysis of the brine, comprising:

a. adjusting the temperature of the conventional brine to a temperature of from about 60° F to about 80° F, the brine having a hardness ion level of about ten parts per million, by weight, based on the weight of the brine, the hardness ion level being based on calcium, the brine having a pH of from about eight to ten,

b. adding sodium carbonate to the brine,

c. stirring the solution,

d. allowing the solution to stand,

e. passing the solution through at least one filter having a nominal pore size of less than five microns, and

f. adjusting the level of the pH of the brine, after filtering, to a level above that of the conventional treated brine,

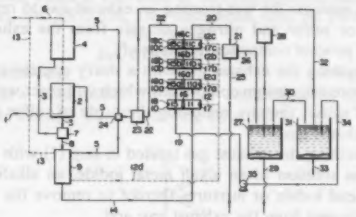
whereby the ion hardness level of the brine is reduced to less than two parts per million, expressed as calcium, prior to electrolysis of the brine.

4,038,366

METHOD FOR REMOVING HYDROGEN SULFIDE

Yutaka Fukuda, Yokohama; Mutsumi Ihida, Tokyo, and Yoshihiko Kawai, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,090
Claims priority, application Japan, June 29, 1974, 49-74768
Int. Cl.[2] B01D *53/34;* C25B *1/00*
U.S. Cl. 423—234 4 Claims



1. A method for removing hydrogen sulfide from a hydrogen sulfide entrained gas comprising the steps of bringing the hydrogen sulfide entrained gas into contact with a caustic alkaline solution with a pH of 10 to 14 to cause hydrogen sulfide in the hydrogen sulfide entrained gas to be absorbed into said caustic alkaline solution (A); introducing the resultant alkaline solution (B) into a least one diaphragm type electrolytic bath, equipped with a cation exchange membrane as a diaphragm, to subject it to a DC electrolytic treatment whereby a alkaline solution (C) is separated and recovered in a cathode chamber of the electrolytic bath, and sulfur and sulfuric acid are separated into an anode chamber of the electrolytic bath; and circulating as said caustic alkaline solution (A) the recovered alkaline solution (C) separated in the cathode chamber.

4,038,367

PROCESS FOR THE REMOVAL OF SO_x AND NO_x FROM WASTE GASES USING ALKALI METAL OR ALKALINE EARTH METAL IODIDE

Masumi Atsukawa, Hiroshima; Naoyuki Takahashi, Saiki; Naoharu Shinoda, and Naohiko Ukawa, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,055
Claims priority, application Japan, May 31, 1974, 49-60904
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 7 Claims

1. A process for the aqueous absorption treatment of an exhaust gas containing oxides of sulfur and oxides of nitrogen which consist essentially of nitrogen dioxide to simultaneously remove both nitrogen dioxide (NO_2) and oxides of sulfur (SO_x) from the exhaust gas, the process comprising the separate, successive steps of:

1. washing and contacting the exhaust gas with an inorganic calcium compound containing slurry, the calcium compound reacting with (SO_x) thereby removing the sulfur oxides from the exhaust gas; and thereafter, in a separate step,

2. washing and contacting the exhaust gas treated according to step (1) with an aqueous solution of an alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide to remove NO_2 from the exhaust gas; and thereafter

3. contacting the slurry remaining from step (1) with the aqueous solution remaining from step (2) to regenerate the alkali metal iodide or alkaline earth iodide solution and to decompose nitrite formed in step (2) to nitrogen.

4,038,368

PROCESS FOR REMOVING OXIDES OF NITROGEN AND SULFUR FROM EXHAUST GASES

Masumi Atsukawa; Naoharu Shinoda, and Naohiko Ukawa, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,051
Claims priority, application Japan, June 3, 1974, 49-61860
Int. Cl.[2] C01B *21/00*
U.S. Cl. 423—235 **9 Claims**

1. A process for wet-treating an exhaust gas to remove an oxide or sulfur and nitrogen dioxide from the exhaust gas, which process comprises the steps of:

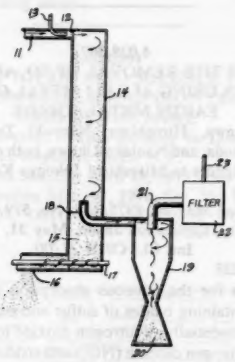
1. washing the exhaust gas with a slurry containing one or more magnesium compounds which will react with oxides of sulfur, thereby removing the oxide of sulfur from the exhaust gas;
2. washing the exhaust gas treated in step (1) with an aqueous solution of an alkali metal iodide, an alkaline earth metal iodide or mixtures thereof to remove the oxide of nitrogen from the exhaust gas; and
3. contacting the slurry from step (1) with the aqueous solution from step (2) to regenerate the solution of alkali metal iodide, alkaline earth metal iodide or mixtures thereof and to decompose any nitrite formed in step (2) to nitrogen.

4,038,369

METHOD FOR THE ABATEMENT OF HYDROGEN CHLORIDE

Steven J. Winston, and Thomas R. Thomas, both of Idaho Falls, Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 14, 1975, Ser. No. 632,027
Int. Cl.[2] B01D *53/34*; C01C *1/16*
U.S. Cl. 423—240 **6 Claims**



1. A method for the abatement of hydrogen chloride in a gas stream generated from the incineration of materials which include polyvinyl-chloride plastics comprising:

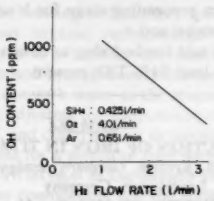
a. introducing ammonia gas into said gas stream containing the hydrogen chloride to form a combined gas stream wherein the ammonia and hydrogen chloride react to form ammonium chloride;
b. passing said combined gas stream into a condensation and collection vessel at a temperature above the sublimation temperature of ammonium chloride;
c. creating the cyclonic flow in said combined gas stream as it passes through said condensation and collection vessel;
d. reducing the temperature of said combined gas stream in said condensation and collection vessel to 160° C or less, whereby ammonium chloride crystals condense and grow on the walls of said vessel and turbulence created by said cyclonic flow breaks off larger particles which are driven to the bottom of said vessel; and
e. removing the solid ammonium chloride particles from the bottom of said vessel.

4,038,370

METHOD OF PRODUCING HIGH-PURITY TRANSPARENT VITREOUS SILICA

Tadashi Tokimoto, and Yoshinobu Hiraishi, both of Hiratsuka, Japan, assignors to Komatsu Electronic Metals Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 616,077
Claims priority, application Japan, Nov. 1, 1974, 49-125564
Int. Cl.[2] C01B *33/12*
U.S. Cl. 423—336 **6 Claims**



1. A method of producing high-purity transparent vitreous silica by supplying to a burner a high purity silane type gas, and an inert gas, hydrogen gas and oxygen gas to effect flame hydrolysis, comprising forming a high-purity transparent vitreous silica which contains metastable OH of less than 500 ppm through flame hydrolysis while maintaining the flow rate of said hydrogen gas at least more than six times the flow rate of said high-purity silane type gas and maintaining the rate of said oxygen gas less than 1.5 times a theoretical supply flow rate required to oxidize completely the silicon in said high-purity silane type gas and the hydrogen which exists when effecting said flame hydrolysis, and heat-treating the transparent vitreous silica obtained at a temperature higher than 800° C. in an inert gas atmosphere for more than 20 hours to reduce the OH content of said transparent vitreous silica to the range from 40 to 60 ppm.

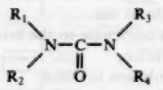
4,038,371

DISMUTATION OF TRICHLOROSILANE

Gilbert Marin, Sainte-Foy-les-Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Nov. 4, 1975, Ser. No. 628,666
Claims priority, application France, Nov. 7, 1974, 74.36961
Int. Cl.[2] C01B *33/08*
U.S. Cl. 423—342 **4 Claims**

1. In a process for the preparation of dichlorosilane and tetrachlorosilane by the disproportionation of trichlorosilane in the presence of a catylyst, the improvement wherein a N,N,N′,N′-tetraalkylurea of the formula:

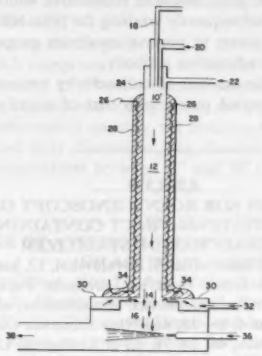


in which each of R_1, R_2, R_3 nd R_4, which may be identical or different, represents a straight or branched alkyl group having from 1 to 6 carbon atoms is used as the catalyst in an amount from 1 to 50% by weight based on the weight of trichlorosilane, the disproportionation being carried out at a temperature from 30° to 120° C. at a pressure up to 3 bars absolute.

4,038,372
PROCESS FOR MANUFACTURING CHLORAMINE

Albert J. Colli, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1976, Ser. No. 683,451
Int. Cl.[2] C01B 21/18
U.S. Cl. 423—413 20 Claims

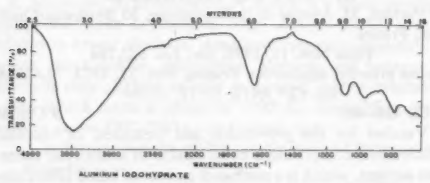


1. A process for the continuous production of chloramine comprising:
- introducing chlorine, ammonia, and an inert gas into a reactor tube;
- heating the reactor tube;
- turbulently flowing said gases through said reactor tube;
- reacting the chlorine and the ammonia to form the chloramine product;
- introducing a purging gas into the reactor discharge zone;
- entraining the product stream in a high velocity jet of a cooling gas; and
- recovering the chloramine.

4,038,373
ALUMINUM HALOHYDRATE

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Continuation-in-part of Ser. No. 45,527, June 11, 1970, abandoned, and Ser. No. 127,351, March 23, 1971, abandoned, and a continuation-in-part of Ser. No. 859,703, Sept. 22, 1969, abandoned, said Ser. No. 45,527, is a continuation-in-part of Ser. No. 859,703, , said Ser. No. 127,351, is a continuation-in-part of Ser. No. 859,703, , and Ser. No. 45,527,. This application Feb. 4, 1974, Ser. No. 439,628
Int. Cl.[2] C01F 7/00, 7/48
U.S. Cl. 423—462 6 Claims



1. A method of preparing a polymeric aluminum halohydrate having a ratio of aluminum to halogen atoms of from 2:1 to 2.7:1 and a stable pH of about 4.2 to about 4.3 which comprises:
- reacting an aqueous solution of a halogen acid selected from hydrochloric acid, hydrobromic acid, hydroiodic acid and hydrofluoric acid with mercury permeated aluminum of a purity of at least 99.98% by weight, the mercury content of said mercury permeated aluminum ranging from about 0.1 to about 5.0 percent by weight;
- and collecting the formed aluminum halohydrate.

4,038,374
STABLE CHLORINE TRIFLUORIDE DIOXIDE

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 529,773, Dec. 5, 1974, abandoned, which is a division of Ser. No. 290,031, Sept. 18, 1972, Pat. No. 3,873,676. This application Aug. 16, 1976, Ser. No. 714,458
Int. Cl.[2] C01B 7/24
U.S. Cl. 423—466 1 Claim

1. A new composition of matter comprising of chlorine trifuloride dioxide, ClF_3O_2, having structure

having the infrared spectrum set forth in the following Table,

Table I

Infrared Spectrum of ClF_3O_2 and its Tentative Assignment		
Frequency (cm^{-1})	Intensity	Assignment for Point Group C_{2v}
1334	s	$\nu_{10}(B_2)$, $\nu asClO_2$
1096	s	$\nu_1(A_1)$, $\nu symClO_2$
699	vs	$\nu_7(B_1)$, $\nu asClF_2Ax$
687	vs	$\nu_2(A_1)$, νClF
598	ms	$\nu_{11}(B_2)$, $\delta rock\ ClO_2$
543)		
532)	mw	$\nu_3(A_1)$ and $\nu_8(B_1)$

and being a white solid which melts at about −81° C to a colorless liquid and boils at about −21 C and is stable up to about +25° C.

4,038,375
PROCESS FOR THE RECOVERY OF SELENIUM FROM SELENIUM-CONTAINING URETHANE SOLUTIONS

James H. Vorachek, Drexel Hill, Pa., and Thomas A. Washall, Wilmington, Del., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 15, 1976, Ser. No. 723,359
Int. Cl.[2] C01B 19/00
U.S. Cl. 423—510 17 Claims

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:
- contacting the selenium-containing urethane solution at a suitable temperature with an aqueous solution of a mercuric salt compound selected from the group consisting of mercuric acetate, mercuric bromide, mercuric chloride, mercuric cyanide and mercuric nitrate or mixtures thereof which salt has a solubility in water of at least 0.5 parts by weight of the salt per 100 parts by weight of water at ambient temperature to form an insoluble mercury-selenium compound or complex precipitate in solution;
- separating the insoluble precipitated compound or complex from the solution;
- subjecting said insoluble mercury-selenium compound or complex to a treatment with nitric acid, heat, air or oxygen to separate selenium and mercury; and
- recovering said selenium.

4,038,376

PROCESS FOR THE RECOVERY OF SELENIUM FROM URETHANES CONTAINING SELENIUM OR COMPOUNDS THEREOF

John J. McCoy, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 12, 1975, Ser. No. 603,998
Int. Cl.[2] C01B *19/00, 25/14*
U.S. Cl. 423—510 9 Claims

1. A process for the recovery of selenium or compounds thereof from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises treating said urethane solution with a metal oxide at a temperature in the range of from about 25° to 250° C. to retain and remove said selenium or compounds thereof from said urethane solution, said metal oxide being selected from oxides of Group B metals of the Periodic Table of Elements, and recovering said selenium and the treated urethane solution.

4,038,377

REMOVAL OF SELENIUM FROM URETHANE SOLUTIONS

Thomas A. Washall, Wilmington, Del., and Harry Morgan, Upper Darby, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 29, 1976, Ser. No. 727,811
Int. Cl.[2] C01B *19/00*
U.S. Cl. 423—510 21 Claims

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:

distilling the reaction product selenium-containing urethane solution at a temperature of from about ambient to about 200° C. to remove unreacted hydroxyl compounds and any contained amine base compounds and/or water;

adding an essentially water insoluble aromatic hydrocarbon or alkyl or halogen substituted aromatic hydrocarbon to said distilled urethane solution forming a hydrocarbon-urethane-selenium-containing solution;

contacting the hydrocarbon-urethane-selenium solution at a temperature of from about ambient to a temperature of up to about 100° C. with an aqueous ammonium hydroxide or alkali metal hydroxide solution to extract selenium compounds from said solution and form a selenium-containing aqueous hydroxide phase and a urethane-containing hydrocarbon phase;

separating the selenium-containing aqueous hydroxide phase from the hydrocarbon phase;

treating the aqueous hydroxide phase to separate selenium compounds therefrom; and

recovering said selenium.

4,038,378

RADIOIMMUNOASSAY FOR HEPATITIS B ANTIGEN

Gyaneshwar Prasad Khare, 311 S. Heatherstone St., Orange, Calif. 92669

Filed Dec. 22, 1975, Ser. No. 643,401
Int. Cl.[2] A61K *43/00*
U.S. Cl. 424—1 8 Claims

1. A process useful for the detection of hepatitis B antigen comprising

a. Reacting an antibody to hepatits B antigen (anti-HB) coated pearl with human plasma or serum sample and allowing sufficient time for the antigen to forma complex with the antibody present on the pearl,

b. Removing the sepcimen and washing the pearl with distilled or deionized water,

c. Carrying on additional reaction following the addition of radioactively labeled antibody to form an additional complex on the pearl.

d. Removing the non-associated radioactive antibody from the pearl and subsequently washing the pearl with distilled or deionized water to remove maximum proportions of unassociated radioactive antibody,

e. Comparing the amount of radioactivity emanating from the sample treated pearls with that of negative control treated pearls.

4,038,379

COMPOSITION FOR ROENTGENOSCOPY OF THE GASTROINTESTINAL TRACT CONTAINING A POLYSACCHARIDE STABILIZER

Nikolai Petrovich Elinov, ulitsa S. Kovalevskoi, 12, korpus 1, kv. 53; Isaak Yakovlevich Gurevich, prospekt Parkhomenko, 35/7, kv. 48; Afrikan Nikolaevich Dranishnikov, ulitsa Tambasova, 8, korpus 4, kv. 13, and Nina Efimovna Goncharova, ulitsa Dobrovoltsev, 46, kv. 76, all of Leningrad, U.S.S.R.

Filed Mar. 24, 1976, Ser. No. 669,991
Int. Cl.[2] A61K *29/02*
U.S. Cl. 424—4 3 Claims

1. A composition for roentgenoscopy of the gastrointestinal tract, comprising 5 to 40 percent by weight of barium sulphate, 0.3 to 0.6 percent by weight of polysaccharide of β-1,3-α-1,4-α-1,6-glucopyranosylglucose, the rest being water.

4,038,380

CALCIUM META SILICATE AS DENTAL POLISHING AGENT

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 17, 1976, Ser. No. 686,848
Int. Cl.[2] A61K *7/16*
U.S. Cl. 424—49 7 Claims

1. A dentifrice toothpaste preparation containing as the essential cleaning and polishing agent, about 5 to about 40% of calcium meta silicate in the form of Wollastonite particles having a hardness value of about 4.5 on Moh's scale, and having a mean diameter in the range of about 2 to 15 microns, and composed of about 50.9% SiO_2 and about 46.9% CaO dispersed in a dental cream toothpaste vehicle.

4,038,381

VACCINE FOR THE PREVENTION AND TREATMENT OF VASCULAR CONDITIONS

René Perlant, 32, Avenue de la Republique, 33 Bordeaux-Cauderan, France

Filed Nov. 11, 1974, Ser. No. 522,754
Claims priority, application France, Nov. 22, 1973, 73.41544
Int. Cl.[2] A61K *39/12, 39/04*
U.S. Cl. 424—89 9 Claims

1. Vaccine for the prevention and treatment of vascular insufficiencies, comprising a combination of a methylic tuberculosis antigen, which is a methanol extract of killed tuberculosis bacilli after fats and waxes have been removed, and an inactivated herpes virus culture assaying $10^{7\pm0.5}$ DCP 50 p. 100 prior to inactivation, said antigen containing as antigenic component about 0.20 ml. of tuberculosis bacillar lipoids per ml. of antigen, said antigen being present in said combination in an amount of 0.02–0.20 ml. of antigen per ml. of said culture.

5. A process for the prevention and treatment of vascular insufficiency, comprising administering to a human patient an effective amount of a vaccine as claimed in claim 1.

4,038,382

ALKYL ESTERS OF POLYENE ANTIBIOTICS

Tiberio Bruzzese, and Rodolfo Ferrari, both of Milan, Italy, assignors to SPA-Societe Prodotti Antibiotici S.p.A., Italy

Division of Ser. No. 381,563, July 23, 1973, Pat. No. 3,936,526. This application Nov. 11, 1975, Ser. No. 630,888

Claims priority, application United Kingdom, July 24, 1972, 34497/72

Int. Cl.[2] H61K *35/00*

U.S. Cl. 424—117 10 Claims

3. A process for the preparation of the methyl ester of candicidin which comprises reacting candicidin with diazomethane in the presence of a basic substance selected from the group consisting of ammonia, triethylamine and pyridine in a substantially stoichiometric quantity, the resulting pH being 10 to 10.5 (determined after dilution to 1%), the reaction being carried out at a temperature between 15° and 30° C.

4,038,383

MIXTURE OF ANTIBIOTICS PRODUCED BY A SPECIES OF ACTINOPLANES

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Charles E. Moppet, Groton; John B. Routien, Lyme, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 541,800, Jan. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,298, April 16, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,260

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—119 5 Claims

2. Antibiotic substance Compound 37,277 which in crystalline form has an optical rotation of $[\alpha]_D^{25°} = +11°$ at a concentration of 1% in ethanol; absorption maxima in ethanol in the ultraviolet light region of the spectrum at 225, 274, 282, 303 and 355 mμ with $F_{1\ cm}^{1\%}$ values of 309.3, 36.67, 45.01, 70 and 20, respectively; having the average composition by weight of 60.91% carbon, 5.98% hydrogen, 10.45% nitrogen and 22.66% oxygen (by difference); and when dissolved in chloroform exhibiting characteristic absorption in the infrared region at the following wavelengths in microns: 3.05, 3.40, 5.70, 5.77, 5.93, 6.07, 6.62, 6.82 and 7.67.

4,038,384

ANTIBIOTIC A-28086 AND PROCESS FOR PRODUCTION THEREOF

David H. Berg, Greenfield; Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 477,954, June 10, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,740

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—122 11 Claims

1. Antibiotic A-28086 factor A which is a white crystalline compound when crystallized from acetone-water; which is soluble in lower alcohols, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; but which is only slightly soluble in hexane; and is insoluble in water; which melts at about 98°–100° C., resolidifies, and remelts at about 195°–200° C. and which has:

a. a molecular weight of 764, as determined by mass spectrometry;

b. an approximate elemental composition of 66.69 percent carbon, 9.85 percent hydrogen, and 23.10 percent oxygen;

c. an empirical formula of $C_{43}H_{72}O_{11}$, as determined by mass spectrometry;

d. a specific rotation of −54° (c=0.2, methanol) when determined at 25° C.;

e. an infrared absorption spectrum in chloroform with the following distinguishable absorption maxima: 2.85, 3.34, 5.83, 6.82, 7.22, 7.53 (weak), 7.78 (weak), 8.75 (strong), 8.95 (strong), 9.15, 9.50 (strong), 9.55 (strong), 9.60, 9.85, 10.15, 10.45, and 10.70 (weak) microns;

f. in its ultraviolet spectrum in ethanol only end absorption below 220 mμ;

g. a nuclear magnetic resonance spectrum in deuterochloroform with the following characteristics: δ6.01, 4.21, 4.11, 3.99, 3.89, 3.80, 3.67, 3.65, 3.57, 3.55, 2.83, 2.76, 2.74, 2.68, 2.66, 2.58, 2.56, 2.30, 2.22, 2.17, 2.10, 2.05, 1.96, 1.90, 1.85, 1.70, 1.62, 1.60, 1.47, 1.39, 1.31, 1.25, 1.18, 0.95, 0.93, 0.90, 0.88, 0,85, 0.77, 0.75, 0.73, 0.68, and 0.66 ppm;

h. a titratable group with a pK_a value of 7.9 in 80% aqueous dimethylformamide;

i. a characteristic X-ray powder diffraction pattern (Cu^{++} radiation, 1.5405 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.00	100
10.10	50
9.25	90
8.00	40
7.50	15
6.92	90
6.40	40
5.98	05
5.68	15
5.20	40
4.98	40
4.62	40
4.21	20
3.48	10

j. an R_f value of 0.24 on thin-layer chromatography over silica gel in a benzene-ethyl acetate (3:2) solvent system, using *Bacillus subtilis ATCC* 6633 as the detection organism;

k. the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as detection organism:

R_f Value	Solvent System
0.11	Water saturated with methyl isobutyl ketone (MIKB)
0.41	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.54	Water:methanol:acetone (12:3:1)-adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.48	1% MIBK, 0.5% NH_4OH in water
0.15	17.4 g K_2HPO_4, 30 ml ethanol per liter of water
0.24	Benzene saturated with water
0.24	Water
0.75	water:MIBK:ethyl acetate (98:1:1)

l) an acid function capable of forming salts and ester derivatives; and

m) at least one hydroxyl group capable of esterificaion;

l. an acid function capable of forming salts and ester derivatives; and

m. at least one hydroxyl group capable of esterification;

an acyl-ester derivative selected from the group consisting of

1. A-28086 factor A acetyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; is only slightly soluble in hexane; and is insoluble in water; which melts at about 100°–103° C.; and which has:

a'. a molecular weight of about 807;

b'. an elemental composition of 67.67 percent carbon, 8.71 percent hydrogen, and 23.13 percent oxygen;

c'. an empirical formula of $C_{45}H_{74}O_{12}$;

d'. an infrared spectrum in chloroform with the following observable absorption maxima: 2.85, 3.36, 3.38 (strong), 5.80, 6.83, 7.25, 7.52 (strong), 7.60 (weak), 7.80 (strong), 8.45 (strong), 8.80 (strong), 8.95 (strong), 9.10 (strong),

9.20, 9.63, 9.80 (strong), 10.12 (weak), 10.25 (weak), and 10.50 microns;

e'. an ultraviolet spectrum showing only end absorption;

f'. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

g'. a titratable group with a pK_a value of 8.5 in 80% aqueous dimethylformamide;

h'. an acid function capable of forming salts and ester derivatives;

2. A-28086 factor A propionyl ester derivative which is a white crystalline compound (from acetone-water); which is solube in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 96°–98° C.; and which has:

a''. a molecular weight of about 821;

b''. an elemental composition of 66.06 percent carbon, 9.17 percent hydrogen, and 23.41 percent oxygen;

c''. an empirical formula of $C_{46}H_{76}O_{12}$;

d''. an infrared absorption spectrum in chloroform with the following observable absorption maxima: 2.85, 3.33, 3.38 (strong), 3.45 (strong), 5.75 (strong), 5.82, 6.81, 7.22, 7.30 (strong), 7.50 (weak), 7.60 (weak), 7.80, 8.43, 8.75 (strong), 8.90, 9.05, 9.15 (strong), 9.50 (strong), 9.63, 9.83 (weak), 10.05 (strong), 10.13, 10.20 (strong), 10.45, and 10.68 microns;

e''. an ultraviolet spectrum showing only end absorption;

f''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

g''. an acid function capable of forming salts and ester derivatives;

3. A-28086 factor A butyryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts about 96°–98° C.; and which has:

a'''. a molecular weight of about 835;

b'''. an approximate elemental composition of 67.60 percent carbon, 9.41 percent hydrogen, and 22.99 percent oxygen;

c'''. an empirical formula of $C_{47}H_{78}O_{12}$;

d'''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.89, 3.40, 3.45, 3.51, 5.85, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.84 (weak), 8.55, 8.85 (weak), 9.01 (strong), 9.26, 9.75, 9.95, 10.31, and 10.64 microns;

e'''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f'''. an acid function capable of forming salts and ester derivatives;

4. A-28086 factor A valeryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 173°–175° C.; and which has:

a''''. a molecualr weight of about 849;

b''''. an approximate elemental composition of 67.89 percent carbon; 9.50 percent hydrogen; and 22.61 percent oxygen;

c''''. an empirical formula of $C_{48}H_{80}O_{12}$;

d''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.99 (strong), 6.91, 7.30, 7.69 (weak), 7.87 (weak), 8.16, 8.58, 8.85 (weak), 9.26, 9.76, 10.00 (weak), 10.31, and 10.64 microns;

e''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f''''. an acid function capable of forming salts and ester derivatives;

and

5. A-28086 factor A caproyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 163°–167° C.; and which has:

a'''''. a molecular weight of about 863;

b'''''. an approximate elemental composition of 68.18 percent carbon; 9.58 percent hydrogen; and 22.24 percent oxygen;

c'''''. an empirical formula of $C_{49}H_{82}O_{12}$;

d'''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.66 (weak), 7.84 (weak), 8.16, 8.58, 8.85 (weak), 9.05 (strong), 9.17, 9.72, 9.95, 10.29, and 10.62 microns;

e'''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f'''''. an acid function capable of forming salts and ester derivatives;

or a pharmaceutically-acceptable salt thereof.

3. A method of increasing feed-utilization efficiency in ruminant animals having a rumen flora which method comprises orally administering to said animal an effective propionate-increasing amount of a compound of claim 1.

4,038,385

PROTECTION OF HORTICULTURAL GROWTH

Alta M. Bowyer, Los Angeles; George B. Hinckley, Montebello, and James E. Davis, Santa Paula, all of Calif., assignors to Leffingwell Chemical Company, Brea, Calif.

Continuation-in-part of Ser. No. 174,228, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 717,972, April 1, 1968, abandoned. This application Apr. 26, 1973, Ser. No. 354,685

Int. Cl.[2] A01N *11/00*

U.S. Cl. 424—166 **4 Claims**

1. A method of repelling deers and rabbit predators from horticultural growth which consists in releasing from a coating on said growth a predator repelling volatile agent selected from the group consisting of primary or secondary amines having up to 10 carbon atoms and ammonia, said agent being released from a coating on said growth to be protected, said coating having been applied as an aqueous composition consisting essentially of 70 to 93 percent water, 3 to 10 percent tall oil and 2 to 10 percent of said agent sufficient to provide a pH between 8 and 12 in said composition as applied.

4,038,386

DERIVATIVE OF DESGLUCOHELLEBRIN AND THERAPEUTIC USE

Otto Isaac, Bruchkobel; Klaus Posselt, Wachtberg-Villiprott, and Horst Uthemann, Frankfurt, all of Germany, assignors to Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Apr. 3, 1975, Ser. No. 564,832

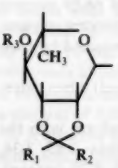
Claims priority, application Austria, Apr. 3, 1974, 2795/74

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—182 **5 Claims**

1. A compound having the formula:

I



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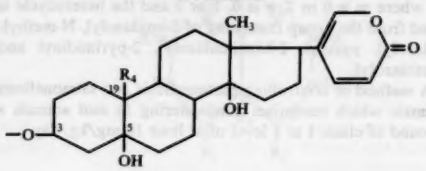


wherein one of R_1 and R_2 is benzyl and the other of R_1 and R_2 is ethyl, R_3 is hydrogen and R_4 is formyl and pharmaceutically acceptable salts thereof.

2. A process of administering to a mammal a compound according to claim 1 in an amount sufficient to have a positive inotropic effect.

4,038,387

1-DIMETHYLCARBAMYL-3-BRANCHED ALKYL-1,2,4-TRIAZOL-5-YL-(N-SUBSTITUTED) SULFONAMIDES AND THEIR USE AS INSECTICIDES

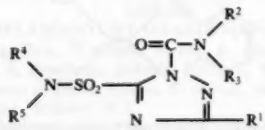
William C. Doyle, Jr., Leawood, and Joel L. Kirkpatrick, Overland Park, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 513,605, Oct. 10, 1974, Pat. No. 3,973,028, which is a continuation-in-part of Ser. No. 407,678, Oct. 18, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,498

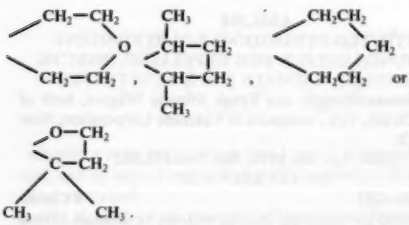
Int. Cl.[2] A01N *9/20*; C07D *413/06*

U.S. Cl. 424—226 **26 Claims**

1. The method of killing aphids on plants comprising applying to the plants a substantially non-phytotoxic but aphicidally effective amount of a compound having the generic structural formula



in which R^1 is C_3 to C_4 secondary or tertiary alkyl or cycloalkyl, R^2 is hydrogen or methyl, R^3 is methyl, and R^4 and R^5 together may be azo, with the added provision that when R^1 is tert.butyl, R^4 and R^5 together may also represent the remainder of a ring structure, selected from one of the following:



8. 1-N,N-dimethylcarbamyl-3-tert.butyl-1,2,4-triazol-5-yl-N,N-dimethylsulfonamide.

4,038,388

ANTIMICROBIAL COMPOSITIONS

David Frederick Cleaver, Hale Barns, England, assignor to Paterson Zochonis & Company Limited, England

Continuation-in-part of Ser. No. 456,199, March 29, 1974, Pat. No. 3,944,668. This application Feb. 20, 1976, Ser. No. 660,062 The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] A61K *31/65*

U.S. Cl. 424—227 **1 Claim**

1. A stable antimicrobial composition for topical or oral application comprising from 1% to 3% of a tetracycline selected from the group consisting of tetracycline, oxytetracycline and chlorotetracycline, from 0.5 to 3% of 5-chloro-8-hydroxyquinoline or 5,7-dichloro-8-hydroxyquinoline and a pharmaceutically acceptable diluent or carrier.

4,038,389

MEDROXYPROGESTERONE ACETATE COMPOSITIONS

Donald J. Lamb, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 587,747, May 7, 1975, abandoned, which is a continuation of Ser. No. 395,667, Sept. 10, 1973, abandoned, which is a continuation of Ser. No. 296,943, July 17, 1972, abandoned, which is a continuation of Ser. No. 74,163, Sept. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 714,436, March 20, 1968, abandoned, which is a continuation of Ser. No. 387,230, Aug. 3, 1964, abandoned. This application Mar. 29, 1976, Ser. No. 671,918

Int. Cl.[2] A61K *31/56*

U.S. Cl. 424—243 **4 Claims**

1. An aqueous suspension for parenteral administration comprising from about 200 to about 600 mg./ml. of suspended medroxyprogesterone acetate; water; from about 0.8% w/v to about 1.5% w/v of sodium sulfate; from about 0.1% w/v to about 1.4% w/v of a parenterally acceptable quaternary ammonium wetting agent; and from about 2% w/v to about 5% w/v of a member selected from the group consisting of glycerin, propylene glycol, polyethylene glycol and polypropylene glycol.

4,038,390

SALTS OF P-DIHYDROXYBENZENE DISULFONIC ACIDS FOR COMBATTING HEMORRHAGES AND FRAGILITY OF THE CAPILLARIES

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios del Dr. Esteve, S.A., Barcelona, Spain

Division of Ser. No. 427,679, Dec. 26, 1973, Pat. No. 3,947,448, which is a continuation-in-part of Ser. No. 359,771, May 14, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,834

Claims priority, application Switzerland, May 17, 1972, 7326/72; Jan. 26, 1973, 1154/73

Int. Cl.[2] A61K *31/495, 31/40, 31/185, 31/205*

U.S. Cl. 424—250 **23 Claims**

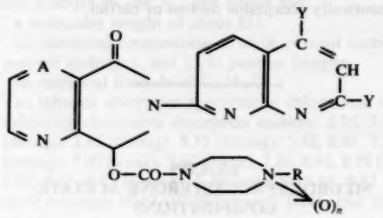
1. A medicament having hemostatic action, a protective action on capillaries, and antilipemic qualities comprising a pharmaceutically acceptable carrier and a phramaceutically effective amount of bis (piperazine) p-dihydroxybenzene disulfonate.

4,038,391
6-(1,8-NAPHTHYRIDIN-2-YL)-5-PIPERAZINO CARBONYLOXY-7-OXO-6,7-DIHYDRO-5H-PYRROLO-[3,4-B]PYRAZINES AND RELATED PYRIDINES

Claude Cotrel, Paris; Cornel Crisan, Sceaux; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 469,431, May 13, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,358
Claims priority, application France, May 15, 1973, 73.17516; Mar. 14, 1974, 74.08728; Mar. 14, 1974, 74.08730
Int. Cl.[2] A61K *31/495;* C07D *471/04*
U.S. Cl. 424—250 11 Claims

1. A naphthyridine compound of the formula:



wherein each Y represents hydrogen, halogen, alkyl of 1 through 4 carbon atoms, or alkoxy of 1 through 4 carbon atoms, =A- represents =CH- or =N-, *n* is zero and R represents alkyl of 1 through 4 carbon atoms, or *n* is 1 and R is methyl, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

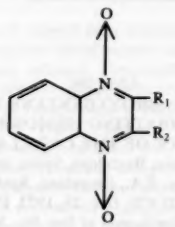
11. A pharmaceutical composition useful as a tranquilliser and anti-convulsant agent which comprises, as active ingredient, an effective amount of a naphthyridine compound of the formula depicted in claim 1 wherein the various symbols have the meanings specified in claim 1, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier.

4,038,392
3-(HETEROCYCLICTHIOMETHYL) QUINOXALINE-1,4-DIOXIDES

Frank J. Urban, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,057
Int. Cl.[2] C07D *403/12;* A61K *31/495*
U.S. Cl. 424—250 4 Claims

1. A compound having the formula



and the pharmaceutically-acceptable acid addition salts thereof, wherein R_1 is hydrogen, acetyl, hydroxymethyl, or

where R_3 and R_4 are hydrogen, lower alkyl, lower hydroxyalkyl or lower aminoalkyl; and R_2 is $CH_2S(O)_m$—$(CH_2)_n$- heterocycle where *m* is 0 or 2, *n* is 0, 1 or 3 and the heterocycle is selected from the group consisting of 2-imidazolyl, N-methyl-2-imidazolyl, pyridyl, 2-benzimidazolyl, 2-pyrimidinyl and 2-benzthiazolyl.

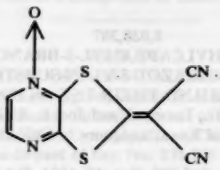
2. A method of controlling pasteurellosis and salmonellosis in animals which comprises administering to said animals a compound of claim 1 at a level of at least 10 mg/kg/day.

4,038,393
1,3-DITHIOLO(4,5-B)PYRAZIN-2-YLIDENE-PROPANEDINITRILE 4-OXIDE

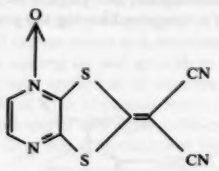
Craig E. Mixan; Christian T. Goralski, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 15, 1976, Ser. No. 649,175
Int. Cl.[2] A61K *31/495;* C07D *495/04*
U.S. Cl. 424—250 3 Claims

1. A compound having the formula



3. A composition useful in preventing the growth of marine organisms on a surface exposed to a marine environment in which marine organisms grow the essential ingredients of which consist of a marine organism cidal amount of the compound having the formula



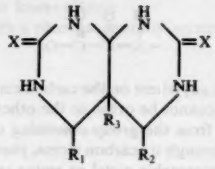
in combination with a substantially water-insoluble synthetic resinous binder of the group consisting of vinyl resins, epoxy resins and polyurethane resins.

4,038,394
SUBSTITUTED PYRIMIDO-[4,5-D]-PYRIMIDINE COMPOUNDS USEFUL FOR REPELLING INSECTS, RODENTS OR ANIMALS FROM SUBSTRATES

Adin Lee Stautzenberger, and Frank Stevens Wagner, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,532
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—251 3 Claims

1. A method for repelling insects, rodents or animals from a substrate which comprises applying to said substrate a repellent effective amount of a pyrimidine compound of the formula:



wherein X is S or O; R_1 is alkyl, cycloalkylalkyl or aralkyl; R_2 is alkyl, cycloalkyl, aryl or aralkyl; and R_3 is H, alkyl, cycloalkyl, aryl or aralkyl; each hydrocarbon radical containing up to about 8 carbon atoms.

4,038,395

COMPOSITIONS OF AND METHOD OF TREATING WITH THE ALPHA-ISOMER OF 2-CHLORO-9-[3'-(N'-2-HYDROXYETHYLPIPERAZINO-N)-PROPYLIDENE]-THIAXANTHENE, CARBOXYLIC ACID ESTERS THEREOF AND ACID ADDITION SALTS OF THESE COMPOUNDS

Niels Lassen, Gentofte, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

Division of Ser. No. 479,814, June 17, 1974, Pat. No. 3,996,211. This application June 16, 1976, Ser. No. 696,800

Claims priority, application United Kingdom, June 25, 1973, 30152/73

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 **20 Claims**

13. A method for the treatment of psychotic disorders in mammals comprising the step of administering to the mammal an effective antipsychotic amount of a compound selected from the group consisting of (1) the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, melting at 84°–85° C., substantially free of the beta-isomer, (2) a carboxylic acid ester thereof with from one to sixteen carbon atoms inclusive, and (3) an acid addition salt thereof with a pharmaceutically acceptable acid.

4,038,396

ANTI-INFLAMMATORY OXAZOLE[4,5-B]PYRIDINES

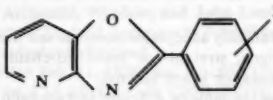
Tsung-Ying Shen, Westfield; Robert L. Clark, Woodbridge; Arsenio A. Pessolano, Colonia; Bruce E. Witzel, Westfield, and Thomas J. Lanza, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 552,018, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 409,504, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,898, June 14, 1972, abandoned. This application May 2, 1975, Ser. No. 574,173

Int. Cl.[2] A61K *31/44*; C07D *498/04*

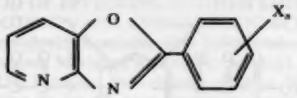
U.S. Cl. 424—256 **36 Claims**

1. A compound of structural formula:



wherein *n* is an integer from 1 to 2 and X is the same or different and is halo, lower alkyl, trifluoromethyl, lower alkoxy, nitro or cyano.

14. A method of treating inflammation, fever or pain in warm-blooded animals and humans in need of such treatment which comprises administration of an effective amount of a compound of structural formula:



wherein *n* is an integer from 1 to 2 and X is the same or different and is halo, lower alkyl, trifluoromethyl, lower alkoxy, nitro or cyano.

4,038,397

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-[(METHOXYMETHYL-FURYL)-METHYL]-6,7-BENZOMORPHAN AND METHOD OF USE

Herbert Merz; Adolf Langbein, both of Ingelheim am Rhein; Gerard Walther, and Klaus Stockhaus, both of Bingen (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

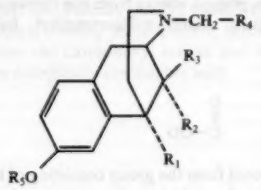
Division of Ser. No. 514,474, Oct. 15, 1974, Pat. No. 3,981,874. This application June 25, 1976, Ser. No. 699,985

Claims priority, application Germany, Oct. 27, 1973, 2354002

Int. Cl.[2] A61Q *31/485*

U.S. Cl. 424—260 **12 Claims**

1. An analgesic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic amount of a compound of the formula



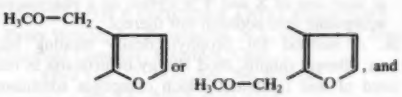
wherein

R_1 is methyl, ethyl or propyl,

R_2 is hydrogen, methyl or ethyl,

R_3 is hydrogen or methyl,

R_4 is



R_5 is hydrogen, methyl or acetyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,038,398

COMPOUNDS, COMPOSITIONS AND METHODS OF USE

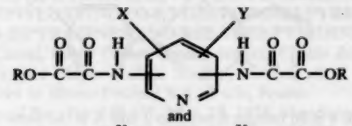
Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 563,919, March 31, 1975, Pat. No. 3,963,660, which is a continuation-in-part of Ser. No. 403,677, Oct. 4, 1973, abandoned. This application Mar. 26, 1976, Ser. No. 670,658

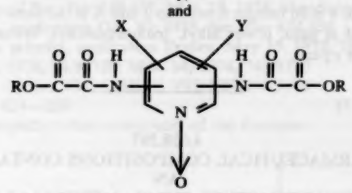
Int. Cl.[2] A61K *31/44*; C07D *213/57*

U.S. Cl. 424—263 **29 Claims**

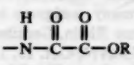
1. A compound of the formula



and



wherein each



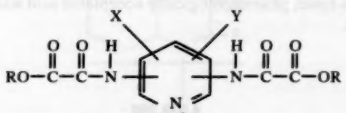
group is located anywhere on the carbon ring with the proviso that one group cannot be ortho to the other group;

R is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, phenyl, and a pharmaceutically acceptable metal or amine cation;

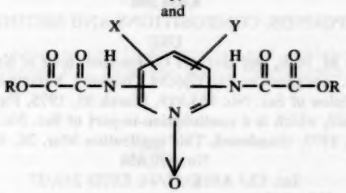
X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one through four carbon atoms, phenyl, alkoxy from one through three carbon atoms, nitro, amino, trifluoromethyl, halogen, cyano, and

wherein D is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, and a pharmaceutically acceptable metal or amine cation with the proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation, then D is the same as R and when R is alkyl from one through six carbon atoms or phenyl, then D is alkyl from one through six carbon atoms, phenyl or hydrogen; with the overall proviso that at least one of X and Y is cyano; or a pharmaceutically acceptable acid addition salt thereof.

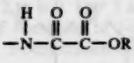
24. A method for prophylactically treating bronchial asthma, allergic rhinitis, food allergy or urticaria in mammals in need of said treatment which comprises administering a compound selected from the group consisting of



and



wherein each



group is located anywhere on the carbon ring with the proviso that one group cannot be ortho to the other group;

R is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, phenyl, and a pharmaceutically acceptable metal or amine cation;

X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one through four carbon atoms, phenyl, alkoxy from one through three carbon atoms, nitro, amino, trifluoromethyl, halogen, cyano, and

wherein D is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, and a pharmaceutically acceptable metal or amine cation with the proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation, then D is the same as R; and when R is alkyl or phenyl, then D is selected from the group consisting of alkyl, phenyl, and hydrogen; with the proviso that at least one of X and Y is cyano; or a pharmaceutically acceptable acid addition salt thereof, in an amount effective to prevent the symptoms of said asthma, rhinitis, food allergy or urticaria,

in association with a pharmaceutical carrier.

4,038,399

1,4-DIHYDROPYRIDINE CARBOXYLIC ACID ESTERS USEFUL AS CORONARY VESSEL DILATORS AND ANTI-HYPERTENSIVES

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

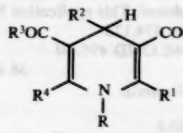
Division of Ser. No. 548,395, Feb. 10, 1975, Pat. No. 3,974,275, which is a division of Ser. No. 350,381, April 12, 1973, Pat. No. 3,905,970. This application Jan. 8, 1976, Ser. No. 647,414

Claims priority, application Germany, Apr. 18, 1972, 2218644

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 **22 Claims**

1. A pharmaceutical composition useful for effecting coronary vessel dilation in humans and animals and for treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, straight- or branched-chain lower alkyl, lower alkenyl or lower alkynyl;

R^1 and R^4 are the same or different and are each hydrogen or straight- or branched-chain lower alkyl;

X is straight- or branched-chain lower alkylene;

Y is the moiety NR'R" wherein R' and R" are the same or different and are each hydrogen or lower alkyl

R^2 is phenyl unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of nitro, cyano, lower alkyl, lower alkoxy, phenyl, trifluoromethyl and halogen; benzyl; phenyl-ethyl; styryl; or naphthyl; and

R^3 is alkoxyalkyl of up to 6 carbon atoms in both moieties; lower alkyl; or lower alkoxy;
in combination with a pharmaceutically acceptable diluent or carrier.

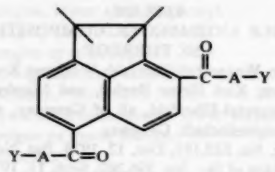
4,038,400

METHOD OF TREATING CONDITIONS OF DELAYED HYPERSENSITIVITY USING BIS-BASIC SUBSTITUTED ACENAPHTHENE DERIVATIVES

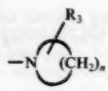
Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 370,289, June 15, 1973, Pat. No. 3,937,842. This application Nov. 3, 1975, Ser. No. 628,530
Int. Cl.[2] A61K *31/445, 31/33, 31/40*
U.S. Cl. 424—267 3 Claims

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a 3,6-bis-basic ketone of acenaphthene having the formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and Y is the group



wherein n is an integer of from 4 to 6, and R^3 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, phenyl and benzyl in which said R^3 group is linked to any of the heterocyclic carbon atoms; and pharmaceutically acceptable salts thereof in an amount effective to suppress delayed hypersensitivity.

4,038,401

NOVEL INDOLE DERIVATIVE

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Feb. 11, 1976, Ser. No. 657,121
Int. Cl.[2] A61K *31/40;* C07D *471/04*
U.S. Cl. 424—267 5 Claims

1. 4-Benzamido-1-[4-(indol-3-yl)-4-oxobutyl]-piperidine or a pharmaceutically acceptable acid addition salt thereof.

5. A method for producing an anti-hypertensive effect without sedation in a warm-blooded animal which comprises administering an anti-hypertensive amount of the compound 4-benzamido-1-[4-(indol-3-yl)-4-oxobutyl]-piperidine or a pharmaceutically acceptable acid addition salt thereof.

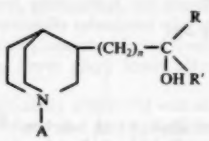
4,038,402

METHOD OF EFFECTING ANTIHISTAMINIC, ANTISEROTONIN AND ANTIALLERGIC ACTIONS

Mikhail Emmanuilovich Kaminka, ulitsa Lobachevskogo, 12, kv. 29; Eva Evseevna Mikhlina, Kutuzovsky prospekt, 5/3, korpus 2, kv. 151; Valentina Yakovlevna Vorobieva, Novo-Alexeevskaya ulitsa, 5a, kv. 13; Anna Dmitrievna Yanina, 2 Karacharovsky proezd, 2, kv. 132; Nadezhda Andreevna Komarova, Shabolovka, 65, korpus, 2, kv. 86; Mikhail Davidovich Mashkovsky, Leningradsky prospekt, 75a, kv. 55, and Leonid Nikolaevich Yakhontov, Nakhimovsky prospekt, 1, korpus 1, kv. 22, all of Moscow, U.S.S.R.

Division of Ser. No. 542,846, Jan. 21, 1975, abandoned. This application July 15, 1976, Ser. No. 705,663
Claims priority, application U.S.S.R., Mar. 5, 1974, 2002003
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 2 Claims

1. Method of effecting at least one of the actions of antihistaminic, antiserotonin and antiallergic action, which comprises administering to a subject requiring such action a corresponding effective dose of a compound of the formula:



where n is selected from the group consisting of 0 and 1, wherein R and R_1 are each selected from the group consisting of phenyl loweralkoxy phenyl, loweralkyl phenyl, lower dialkyl phenyl, thienyl, chlorophenyl, benzoyl, cyclohexyl, phenylketone and clorophenyl ketone, and wherein A is absent or is a physiologically compatible acid.

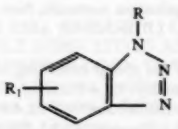
4,038,403

BENZOTRIAZOLE OVICIDES AND LARVICIDES

Donald Perry Wright, Jr., Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 17, 1975, Ser. No. 623,234
Int. Cl.[2] A01N *9/00, 9/22*
U.S. Cl. 424—269 12 Claims

1. A method for the control of insects and acarina comprising, contacting the eggs of the insects and acarina with an ovicidally effective amount of a compound of the formula:



wherein R represents alkyl C_3–C_8 straight chain or branched, alkoxy C_1–C_8 straight chain or branched, cycloalkyl C_3–C_8, cycloalkenyl C_5–C_6, mono- or di- C_1–C_3 alkylcyclohexyl, cyclohexylmethyl, formyloxycyclohexyl, or $—CONR_2R_3$ wherein R_2 and R_3 represent hydrogen or alkyl C_1–C_4; and R_1 represents $—NO_2$ or —NCS.

4,038,404

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

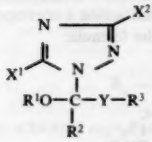
Division of Ser. No. 432,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 646,056

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.[2] H61K *31/41*

U.S. Cl. 424—269 28 Claims

14. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and

Y is CO;

in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,038,405

ACARICIDAL TRIFLUOROMETHYL-1,2,4-TRIAZOLES

John James Alexander Evans, East Brighton, and George Holan, Brighton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Nov. 11, 1974, Ser. No. 522,626

Claims priority, application Australia, Nov. 13, 1973, 5638/73

Int. Cl.[2] C07D *249/08;* A01N *9/22*

U.S. Cl. 424—269 4 Claims

1. A compound of the group consisting of:

4-phenyl-3-trifluoromethyl-1,2,4-triazole;

4-(4-chlorophenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(2-methylphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(2-t-butylphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(2-methoxyphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(4-ethoxyphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(4-t-butylphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(2,4-dimethylphenyl)-3-trifluoromethyl-1,2,4-triazole;

4-(4-chloro-2-methylphenyl)-3-trifluoromethyl-1,2,4-triazole;

3-methyl-4-phenyl-5-trifluoromethyl-1,2,4-triazole;

3,4-bis(4-chlorophenyl)-5-trifluoromethyl-1,2,4-triazole;

1-phenyl-3-trifluoromethyl-1,2,4-triazole;

3-trifluoromethyl-1,2,4-triazole;

3(5)-phenyl-5(3)-trifluoromethyl-1,2,4-triazole;

3(5)-(4-chlorophenyl)-5(3)-trifluoromethyl-1,2,4-triazole; and

3(5)-(3,4-dichlorophenyl)-5(3)-trifluoromethyl-1,2,4-triazole.

4. A pest control composition comprising an acaricidally effective amount of a triazole compound as defined in claim **1** in admixture with a solid or liquid carrier material.

4,038,406

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

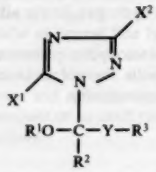
Division of Ser. No. 532,191, Dec. 12, 1974, Pat. No. 4,002,763, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Dec. 31, 1975, Ser. No. 645,563

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.[2] A61K *31/41*

U.S. Cl. 424—269 22 Claims

11. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 to 2 carbon atoms in the alkyl moiety, unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R_3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and

Y is CO,; in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,038,407

BENZISOTHIAZOLINE-1,1-DIOXIDE DERIVATIVES, COMPOSITIONS AND METHODS

Wolfgang Eberlein; Eberhard Kutter, both of Biberach an der Riss; Joachim Heider, Warthausen; Volkhard Austel, Biberach an der Riss; Rüdolf Kadatz, Biberach an der Riss; Willi Diederen, Biberach an der Riss, all of Germany; Walter Kobinger; Christian Lillie, both of Vienna, Austria, and Jürgen Dammgen, Warthausen, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

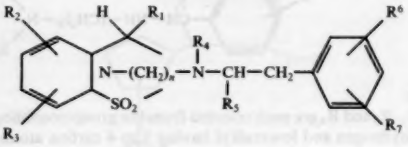
Filed Feb. 24, 1976, Ser. No. 660,841

Claims priority, application Germany, Mar. 6, 1975, 2509797; Dec. 23, 1975, 2558274

Int. Cl.[2] A61K *31/425;* C07D *91/12*

U.S. Cl. 424—270 4 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl or phenyl,

R_2 is hydrogen, chlorine or methoxy,

R_3 is hydrogen or methoxy

R_2 and R_3, together with each other, are methylenedioxy or ethylenedioxy,

R_4 and R_5 are each hydrogen or lower alkyl,

R_6 is hydrogen or lower alkoxy,

R_7 is lower alkoxy,

R_6 and R_7, together with each other, are methylenedioxy or ethylenedioxy, and

n is 2 or 3,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. The method of reducing the heart rate in a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective heart rate reducing amount of a compound of claim 1.

4,038,408

CERTAIN THIAZOLYL AND ISOTHIAZOLYL COMPOUNDS AND COMPOSITIONS AND METHODS WHICH EMPLOY THEM

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, England; Torben Hesselbo, North Berwick, Scotland, and George Raymond White, Harpenden, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed July 13, 1976, Ser. No. 704,871

Claims priority, application United Kingdom, July 31, 1975, 31969/75

Int. Cl.[2] C07D *417/00, 277/26, 275/02*

U.S. Cl. 424—270 11 Claims

1. A compound of the formula:

wherein Het and Het′ are each selected from imidazole optionally substituted by methyl or bromo, thiazole, and isothiazole, provided that at least one of Het and Het′ is thiazole or isothiazole; Z is sulphur, SO or methylene; X is sulphur, $CHNO_2$ or NCN.

11. A method of blocking histamine H_2-receptors which comprises administering to an animal a compound of claim 1.

4,038,409

1-PHENETHYLIMIDAZOLES

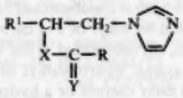
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 1, 1976, Ser. No. 662,786

Int. Cl.[2] A61K *31/415;* C07D *233/60*

U.S. Cl. 424—273 33 Claims

1. A compound selected from those represented by the formula

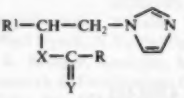
 wherein

R is H, alkyl of 1 to 12 carbon atoms, phenylalkenyl of 8 to 9 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, to 9 carbon atoms, phenyl, cycloalkyl of 5 to 8 ring carbon atoms, cycloalkyl lower alkyl of 6 to 9 carbon atoms, said phenylalkenyl, phenylalkyl, and phenyl each being independently optionally substituted with at least one substituent on the phenyl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, and trifluoromethyl;

R^1 is phenyl optionally substituted with at least one substituent selected from the group consisting of halo, lower alkyl, and trifluoromethyl; and

X and Y are independently sulfur or oxygen and the antimicrobial acid addition salts thereof.

33. A method of inhibiting the growth of fungi, protozoa, or bacteria which comprises applying to a host object containing or subject to attack by, fungi, protozoa, or bacteria, a fungicidally, protozoicidally, or bactericidally effective amount of a compound selected from these represented by the formula

 wherein

R is H, alkyl of 1 to 12 carbon atoms, phenylalkenyl of 8 to 9 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, phenyl, cycloalkyl of 5 to 8 ring carbon atoms, cycloalkyl lower alkyl of 6 to 9 total carbon atoms, said phenylalkenyl, phenylalkyl, and phenyl each being independently optionally substituted with at least one substituent on the phenyl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, and trifluoromethyl;

R^1 is phenyl optionally substituted with at least one substituent selected from the group consisting of halo, lower alkyl, and trifluoromethyl, and

X and Y are independently sulfur or oxygen and the antimicrobial acid addition salts thereof or a composition containing same as an active ingredient.

4,038,410

NITROIMIDAZOLE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Clemens Rufer; Katica Schwarz, and Hans-Joachim Kessler, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Mar. 12, 1975, Ser. No. 557,539

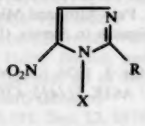
Claims priority, application Germany, Mar. 14, 1974, 2412656; Mar. 14, 1974, 2412657

Int. Cl.[2] A61K *9/22;* C07D *239/22, 403/04*

U.S. Cl. 424—273 23 Claims

1. A member of the group consisting of

1. a 5-nitroimidazole of the formula



wherein X is alkyl of 1–4 carbon atoms and R is

a. 3-dialkylamino-acryloyl of 1–4 carbon atoms in each alkyl group;

b. 3-, 4-, or 5-pyrazolyl which is unsubstituted or which is (i) mono- or di- substituted by alkyl of 1–4 carbon atoms on 1–2 ring carbon atoms, (ii) substituted at the 1-position by alkyl of 1–4 carbon atoms, hydroxyalkyl of 2–5 carbon atoms or a nitric acid ester thereof or a hydrocarbon-carboxylic acid ester thereof of a total of 4–9 carbon atoms, nitro, phenyl or phenyl substituted by a p-halogen atom, p-alkoxy of 1–4 carbon atoms, or p- or m-nitro, or (iii) substituted both on 1–2 ring carbon atoms and at the 1-position as defined hereinabove;

2. a position isomer mixture of pyrazolyl-substituted 5-nitroimidazoles as defined in (1) (b) whose respective pyrazolyl rings are attached at different ring carbon atoms thereof to the 5-nitroimidazole ring; and

3. physiologically acceptable acid addition salts of each of the above.

22. A pharmaceutical composition comprising, in unit dosage form, an anti-protozoal effective amount per unit dosage of a compound of claim **1** or a mixture of position isomers as defined therein, in admixture with a pharmaceutically acceptable carrier.

4,038,411

ANTIHYPERTENSIVE AMINO ACID ESTERS

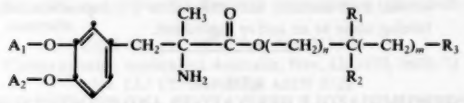
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 482,102, June 25, 1974, Pat. No. 3,983,138, which is a continuation-in-part of Ser. No. 400,609, Sept. 25, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,908

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **24 Claims**

1. A method of treating hypertension in a hypertensive animal which comprises administering to the animal a therapeutically effective amount of a compound of the formula



wherein

n is 0, 1, 2 or 3;

m is 0, 1, 2 or 3;

A_1 and A_2 are individually H or a lower alkanoyl group;

R_1 and R_2 are individually H or alkyl of 1 to 3 carbon atoms and;

R_3 is a monocyclic, heterocyclic radical containing 1 or 2 nuclear N atoms, said heterocyclic radical containing 5 to 6 members

or a pharmaceutically acceptable acid addition salt thereof.

4,038,412

N-(PHENYLETHER-SUBSTITUTED BENZYL)ALKANEDIAMINES

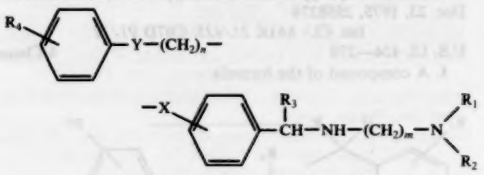
J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Aug. 25, 1975, Ser. No. 607,333

Int. Cl.[2] A01N *9/20*; C07C *87/28*

U.S. Cl. 424—280 **9 Claims**

1. An N-(substituted benzyl)alkanediamine having the formula:



wherein

R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrogen and loweralkyl having 1 to 4 carbon atoms;

X is selected from the group consisting of oxygen, sulfur and SO_2;

Y is oxygen or a sigma bond;

m is an integer of from 2 to 4;

n is an integer of from 1 to 4 with the proviso that when Y is oxygen, then *n* cannot be 1; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating a host susceptible to invasion by pathogenic viral agents caused by viruses which comprises administering from 0.1 milligram to 500 milligrams per kilogram of body weight per day of an N-(substituted benzyl)alkanediamine of claim **1**.

4,038,413

TREATING IRON DEFICIENCY ANAEMIA

John Louis Suschitzky, and David Rutherford, both of Loughborough, England, assignors to Fisons Limited, London, England

Division of Ser. No. 522,591, Nov. 11, 1974, Pat. No. 3,960,911. This application Mar. 5, 1976, Ser. No. 664,280

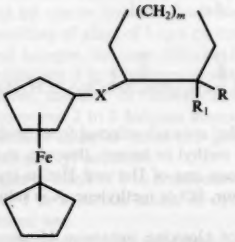
Claims priority, application United Kingdom, Nov. 21, 1973, 54002/73; July 17, 1974, 31609/74

Int. Cl.[2] A61K *31/295*

U.S. Cl. 424—295 **6 Claims**

4. A method for treating iron deficiency anaemia in animals, said method comprising administering to an animal having iron deficiency anaemia a therapeutically effective amount of a compound of the formulas

(1)



(2)

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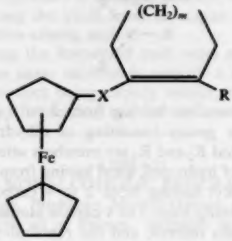
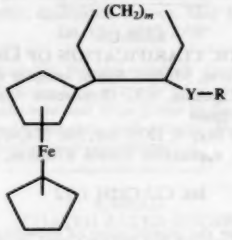
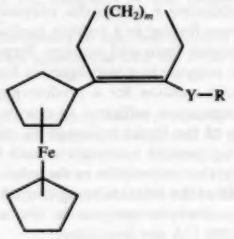
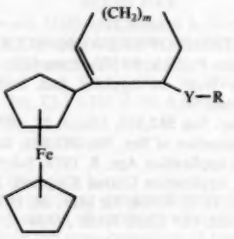
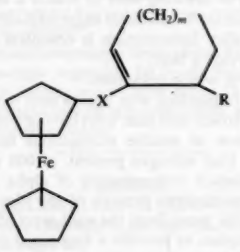










in which

R is alkyl, chlorine, bormine, phenyl, or phenyl substituted by one or more halogen or alkyl groups.

X is a group —CO—, —CHOH or —CH_2—,

Y is a group —CO—, —CHOH or —CH_2—,

m is an integer from 1 to 3, and

R_1 is hydrogen, or is hydrogen or —OH when X is —CO—.

4,038,414

AMINES AND PROCESSES FO.' THEIR MANUFACTURE

Knut Alfred Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

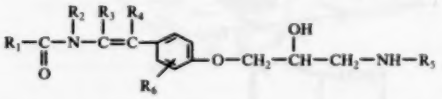
Division of Ser. No. 367,092, June 4, 1973. This application Dec. 19, 1975, Ser. No. 642,628

Claims priority, application Switzerland, June 8, 1972, 8505/72; Apr. 18, 1973, 5634/73

(3) **Int. Cl.**[2] **C07C** *103/12*

U.S. Cl. 424—304 **7 Claims**

1. An amine of the formula I



(I)

wherein R_1 is lower alkyl, R_2 is hydrogen or lower alkyl, R_3 is hydrogen or lower alkyl, R_4 is hydrogen or lower alkyl, R_5 is lower alkyl, phenyl-lower alkyl, or phenyl lower alkyl substituted by lower alkyl, lower alkoxy, halogen and/or trifluoromethyl and R_6 denotes halogeno, trifluoromethyl, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkoxymethyl, carbamoyl, N-lower alkylcarbamoyl, cyano, lower alkinyloxy or hydrogen, or a therapeutically acceptable acid addition salt thereof.

(4)

4,038,415

PROSTAGLANDIN DEHYDROGENASE INHIBITING AGENTS

Vithal J. Rajadhyaksha, Mission Viejo, Calif.; Richard A. Schroer, West Nyack, N.Y.; Phillip J. Brock, Mountain View, and Earl R. Krueger, Anaheim, both of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

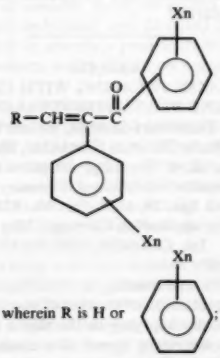
Division of Ser. No. 602,736, Aug. 7, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,432

(5) **Int. Cl.**[2] **A61K** *31/19, 31/12, 31/165*

U.S. Cl. 424—317 **12 Claims**

1. A method for inhibiting the activity of 15-OH prostaglandin dehydrogenase in humans or animals comprising administering to a human or animal an effective amount of a compound having the structural formula

(6)



wherein R is H or ;

X is selected from the group consisting of OH, lower alkyl, lower alkoxy, aryl, substituted aryl, halogen, nitro, trihaloalkyl, —NR_1R_2 and —$NHCOR_1$ where R_1 and R_2 are selected

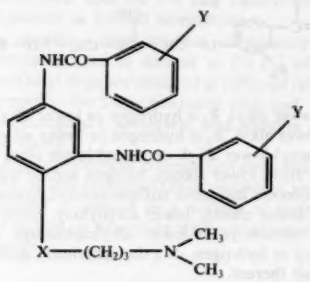
from the group consisting of H, lower alkyl and NH_2; and *n* is 0–5.

4,038,416
PHARMACEUTICAL COMPOSITION AND METHOD OF THE USE THEREOF

Takashi Mori, Tama; Sakae Takaku, Ageo; Nobuhiro Oi, Hoya; Minoru Shindo, Higashikurume; Takeaki Hirano, Fujimi; Shigeyuki Kataoka, Saitama, and Kouji Furuno, Kokubunji, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 11, 1975, Ser. No. 612,500
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **17 Claims**

1. A pharmaceutical composition for prevention and treatment of peptic ulcer and gastritis of a mammal including human being comprising a bis(benzamido)-benzene derivative represented by the formula



wherein X is oxygen and Y is methyl attached to o- or m-position of benzene nucleus or an acid addition salt thereof in an amount sufficient to prevent and treat the gastritis and peptic ulcer and a pharmaceutically acceptable carrier.

4,038,417
METHOD FOR TREATMENT OF PSORIASIS

Eric Loren Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed June 19, 1975, Ser. No. 588,233
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 **6 Claims**

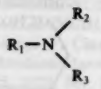
1. A method for treating psoriasis in humans comprising administering to a human suffering from psoriasis an effective dose for treating psoriasis of a composition comprising isoproterenol or a pharmaceutically acceptable salt thereof, and a pharmaceutical carrier.

4,038,418
PROCESS OF SKIN TREATING WITH COMPOSITIONS CONTAINING POLYHYDROXYALKYLAMINES

Hinrich Möller, Dusseldorf-Benrath; Rainer Osberghaus, Dusseldorf-Urdenbach; Christian Gloxhuber, Haan, and Siegfried Braig, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H, Dusseldorf-Holthausen, Germany

Filed Apr. 28, 1975, Ser. No. 572,270
Claims priority, application Germany, May 4, 1974, 2421618
Int. Cl.[2] A61K *7/00, 31/13*
U.S. Cl. 424—358 **6 Claims**

1. A process for maintaining or restoring hygroscopicity in the skin for the protection of the skin of warm-blooded animals comprising topically applying to the skin a safe but effective amount as a moisturizing agent of a cosmetic composition consisting essentially of an aqueous medium adjusted to a pH between 5 and 7 containing from 1 to 20% by weight of at least one hydroxyalkylamine selected from the group consisting of (1) compounds having the formula



wherein R_1 is a member having from 3 to 6 carbon atoms selected from the group consisting of dihydroxyalkyl and trihydroxyalkyl, and R_2 and R_3 are members selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, hydroxyalkyl having from 2 to 4 carbon atoms and dihydroxyalkyl having from 3 to 4 carbon atoms, and (2) topically-inert acid salts thereof; and the remainder to 100% by weight of inert cosmetic excipients.

4,038,419
ENZYMATIC CLARIFICATION OF LIQUIDS

Ricardo Segura Ferns, Madrid, Spain, assignor to Instituto de Farmacologia Espanola, S.L. (Fundacion Marques de Urquijo), Madrid, Spain

Filed May 6, 1975, Ser. No. 574,907
Claims priority, application United Kingdom, May 6, 1974, 19884/74
Int. Cl.[2] C12H *1/12*
U.S. Cl. 426—12 **3 Claims**

1. A method for the clarification of turbidity, and for the prevention of turbidity in, aqueous liquid beverages comprising the steps of producing a proteolytic enzyme by fermentation of Streptomyces fradiae in a culture medium, separating said proteolytic enzyme from said medium, forming a solution of said proteolytic enzyme in a said aqueous liquid beverage, and maintaining said solution for a predetermined time at a predetermined temperature sufficient to clarify the actual or potential turbidity of the liquid beverage by said proleolytic enzyme hydrolyzing protein materials in said beverage that cause said turbidity; the temperature of the solution being from 0° to 85° C., the pH of the solution being from 3 to 10, and the activity of said proteolytic enzyme in the solution being 200,000 to 20,000,000 UA per hectoliter.

4,038,420
METHOD OF BREWING BEER

James Richard Allan Pollock, 56 New Lane Hill, Tilehurst, and Michael Joseph Weir, 24 Appleby End, both of Reading, Berkshire, England

Continuation of Ser. No. 562,959, March 28, 1975, abandoned, which is a continuation of Ser. No. 367,824, June 7, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,703
Claims priority, application United Kingdom, June 27, 1972, 30061/72; Oct. 13, 1972, 47404/72; Mar. 28, 1973, 14916/73
Int. Cl.[2] C12C *9/00, 11/04*
U.S. Cl. 426—16 **8 Claims**

1. In a method of brewing beer in which a brewer's wort containing malt extract fermentable sugar adjunct is fermented with yeast and, after fermentation is complete, the yeast is filtered off to provide a beer,

the improvement which comprises:

1. separately fermenting with yeast a malt wort containing said malt extract, said malt wort having a minimum total concentration of soluble nitrogenous substances, expressed as total nitrogen present, of 600 mg. per liter, and a minimum concentration of alpha amino acids, expressed as nitrogen present, of 150 Mg. per liter;
2. removing the yeast from the malt wort after fermentation is complete to provide a fermented malt wort;
3. separately fermenting with yeast with stirring, in an amount of at least 5.7 gm. equivalent pressed yeast per liter, an aqueous sugar solution containing said fermentable sugar, said aqueous sugar solution having a maximum total concentration of soluble nitrogenous substances, expressed as total nitrogen present, of 200 mg.

per liter, and a maximum concentration of alpha amino acids, expressed as nitrogen present, of 70 mg. per liter;

4. removing the yeast from the sugar solution after fermentation ceases; and
5. blending the fermented malt wort and the fermented aqueous sugar solution to provide a beer product, said beer product being closely similar in flavor to a beer made by fermenting said brewer's wort.

4,038,421

NONALCOHOLIC BEVERAGE

Francois Mendy, Boulogne; Michel Delage, and Jean Teissier, both of Paris, all of France, assignors to Roussel-UCLAF, Paris, France

Filed May 10, 1976, Ser. No. 684,773
Claims priority, application France, May 16, 1975, 75.15383
Int. Cl.[2] A23L *2/00*
U.S. Cl. 426—72 **9 Claims**

1. A nonalcoholic beverage which comprises 30 to 100 grams/l of galactose, 15 μ grams to 65 μ grams of riboflavine per gram of galactose and 35 μ grams to 50 μ grams nicotinic acid per gram of galactose and mineral elements potassium, sodium, phosporous and magnesium.

4,038,422

COATED BAKED GOODS

William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 543,435, Jan. 23, 1975, abandoned. This application Oct. 20, 1975, Ser. No. 623,643
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—72 **22 Claims**

1. A coating for coating baked products, said coating comprising: from about 30 percent to about 40 percent by weight vegetable fat or oil, from about 10 percent to 40 percent by weight sugar, from about 25 percent to about 50 percent by weight non-fat dry milk solids, and a flavoring agent.

4,038,423

FOOD BAR

James R. Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,453
Int. Cl.[2] A23J *3/00*; A23G *3/00*
U.S. Cl. 426—72 **11 Claims**

1. A food bar comprising:

A. a base; and

B. a coating thereon;

C. said base comprising marshmallow fortified with a high protein ingredient of reduced water binding capability, selected from the goup consisting of heat treated protein, fat coated protein and combinations thereof, said high protein ingredient having a protein content of at least 30 percent by weight;

D. said coating comprising from about 30 to about 40 percent by weight vegetable fat or oil, from about 10 to 40 percent by weight sugar, from about 25 to about 50 percent by weight non-fat dry milk solids, a flavoring agent, and fat coated vitamins.

4,038,424

VEGETABLE SAUCE COMPOSITION

Donald L. Davies, Glen Ellyn, DuPage, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Jan. 22, 1976, Ser. No. 651,408
Int. Cl.[2] A23L *1/24*
U.S. Cl. 426—94 **12 Claims**

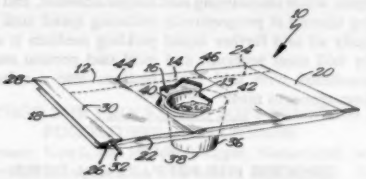
1. An improved aerated food sauce composition, said composition comprising: extended strands of a tomato paste in an amount of about 44–54% of said composition combined with a fat congealable at room temperature in an amount of about 39–44% of said composition.

4,038,425

COMBINED POPPING AND SHIPPING PACKAGE FOR POPCORN

Lawrence C. Brandberg, and David W. Andreas, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Sept. 25, 1974, Ser. No. 508,963
Int. Cl.[2] B65D *77/14*
U.S. Cl. 426—107 **8 Claims**



1. A double compartmented combined popping and shipping package for popcorn comprising a supporting base including a first semi-rigid compartment having side and bottom walls and a second flexible compartment communicating therewith and having first and second parallel sheets of flexible material defining the upper and lower surfaces thereof, said first and second sheets being connected together at their edges and expansion pleats in the sheets to allow expansion of the second compartment, said second compartment being located outside the walls of the first compartment and supported at the upper end of the first compartment to define the top of the package and being of sufficient size after popping to hold all of said popcorn after it has popped except that which remains in the first compartment, said second compartment being larger than the first compartment.

4,038,426

PROCESS FOR PICKLING MEAT SECTIONS

Knud Jespersen, R.R. No. 1, Terracotta, Ontario, and Theodore Edgar Engman, 429 58th Avenue South East, Calgary, Alberta, both of Canada

Continuation-in-part of Ser. No. 562,474, March 27, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,575
Int. Cl.[2] A23B *4/02*
U.S. Cl. 426—266 **3 Claims**

1. A process for pickling meat sections selected from the group consisting of briskets, hams, or picnics, said meat sections being skinned de-bonded, and de-fatted portions thereof and being intended to absorb a predetermined quantity of a liquid pickling medium, and said process comprising the steps of;

injecting said meat sections with a first quantity of a liquid pickling medium, less than said predetermined quantity;

placing said meat sections in a container together with an additional quantity of said liquid pickling medium said first quantity, and said additional quantity of pickling medium together totalling substantially exactly the quantity of liquid pickling medium desired to be absorbed by said meat sections in the process;

continuously rotating a stirring member at a predetermined torque value sufficient to procure rotation of a speed of between four and eighteen revolutions per minute, within a central part of said container, while leaving other parts remote from the center free of such stirring, thereby subjecting some said meat sections to direct stirring action by contact with said stirring member in said central part of said container while other said meat sections in said other parts of said container are out of contact with said stirring

member, and are subjected to movement of other meat sections, whereby to produce a continuous gentle massaging action on said meat sections, and a continual transfer of meat sections from said central portion of said container to said other portions, and back again, said gentle massaging action producing a gradual exudation of soluble protein material from said meat sections, and a gradual absorption of said further quantity of said pickling medium in said container by said meat sections, said exuded protein material rendering the contents of said container more viscous, and hence imposing a greater stirring load on said stirring member, and,

reducing the speed of rotation of said stirring member gradually in response to the increasing viscosity of said contents, while maintaining said torque constant, and continuing stirring at progressively reducing speed until substantially all said further liquid pickling medium is absorbed by said meat sections, and until said protein material is combined with said meat sections into a substantially homogeneous mass.

4,038,427

PROCESS FOR PREPARING A DRIED AGGLOMERATED CEREAL MIXTURE

Thom O. Martin, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 457,687, April 3, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,560

Int. Cl.[2] A23L *1/18*

U.S. Cl. 426—285 **25 Claims**

1. Process for preparing a dried agglomerated cereal mixture which comprises mixing at least 25% by weight of amylaceous and proteinaceous bumped whole cereal grains, grain by-products of varying particle size and density and a quantity of flaked puffed gelatinized cereal grains having dextrinous surfaces and a lower particle density than the balance of said cereal mixture combined and adapted to receive on the surfaces thereof finer cereal mixture particles upon being wetted; causing a liquified fat to coat and be evenly distributed over the cereal mixture together with a saccharidal syrup having a D.E. of at least 5, continuously tumbling the coated cereal mixture particles until they aggregate to form a heterogeneous cluster of particles adhering around the discrete and separate puffed flakes; and thence drying the aggregates to produce an agglomerated cereal mixture.

4,038,428

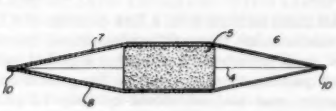
METHOD OF PACKAGING PIECRUST DOUGH

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 498,575, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 404,869, Oct. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 307,535, Oct. 17, 1972, Pat. No. 3,819,316. This application Dec. 22, 1975, Ser. No. 643,483

Int. Cl.[2] B65B *55/00*

U.S. Cl. 426—394 **55 Claims**



1. The method of packaging a prepared dough mass that is to besubsequently reshaped by rolling within its packaging receptacle into crust form, including the steps of depositing the prepared dough mass between two thinly formed sheets of flexible material within which at least one of the sheets includes a plurality of air venting ports sufficiently small as to allow the passage of air into and from the receptacle without allowing the viscus dough material extruding excessively from the receptacle through these ports during a normal dough rolling operation and during such time as relatively high pressures are applied to the dough within the receptacle, extending the sheets outwardly from the dough mass to bring the sheets together, securing the sheets together in spaced relation to the dough mass and along a plane extending substantially through the center of the dough mass to form a receptacle about said dough mass, removing substantially all air from within the receptacle to bring the inner surfaces of the receptacle together and closely about the dough mass, inclosing the assembled dough mass and receptacle within a closable container.

4,038,429

ENHANCING CHEESE FLAVOR IN FOODS WITH A DIKETO-PIPERAZINE

Alistair Y. Smith, Geneva; Paul Dietrich, Chene-Bourg, and Wilhelm Pickenhagen, Onex, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

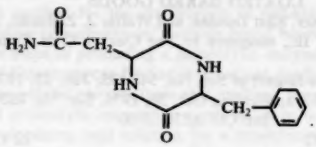
Filed June 28, 1976, Ser. No. 700,168

Claims priority, application Switzerland, July 2, 1975, 8589/75; Oct. 10, 1975, 13499/75

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—537 **3 Claims**

1. A cheese, a cheese-imitating or a cheese-containing product having added thereto from about 10 to 200 ppm of a diketopiperazine of the formula



(I)

4,038,430

PROTECTION OF GLASS FROM AQUEOUS ATTACK

Cyril Francis Drake, Harlow, and Robert Walter James Amos, New Barnet, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,025

Int. Cl.[2] B05D *3/04*

U.S. Cl. 427—248 E **3 Claims**

1. A method of encapsulating a substrate in glass comprising the steps of:

applying a coating of lead borate glass onto a substrate;

introducing a stream of oxygen containing phosphorus pentoxide to the coated substrate; and

heating the coated substrate in the phosphorus pentoxide-containing oxygen stream to form a layer containing both boron and phosphate oxides on said lead borate glass.

4,038,431

PROTEIN TEXTURIZATION BY STEAM INJECTION

William M. Hildebolt, Mickleton, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,612

Int. Cl.[2] A23J *1/00*

U.S. Cl. 426—511 **9 Claims**

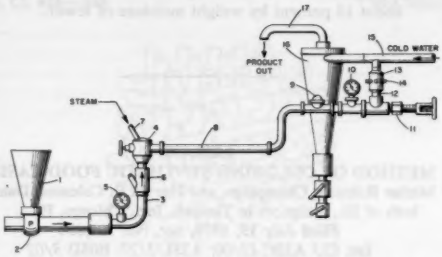
1. A method for producing texturized protein material comprising:

a. mixing untextured protein material and water to form a slurry, said protein material containing at least 70% protein on a dry weight basis, said slurry containing about 40 to 50% solids;

b. injecting a heated gaseous stream into said slurry to propel said protein material into and through a confined treating zone, said heated gaseous stream being at a temperature sufficient to maintain the temperature in said confined zone in the range of about 310° to 350° F., whereby said

protein material is rendered to a thermoplastic state and texturized during its passage through said confined zone;

c. transferring said texturized thermoplastic protein material out of the confined treating zone through a means for maintaining back pressure disposed at the discharge end of said confined zone, said means for maintaining back pressure maintaining a pressure of from about 60 to about 80 psi in said confined zone;



d. passing said texturized thermoplastic protein material through means for agglomerating and stretching said protein material, just after its passage through said means for maintaining back pressure; and

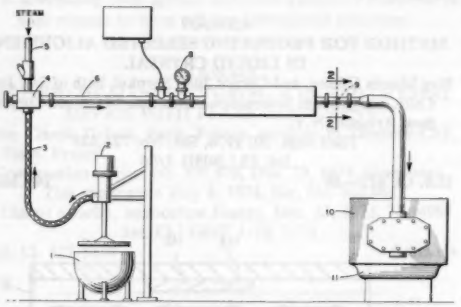
e. recovering said texturized protein product in a collection zone.

4,038,432

PROTEIN TEXTURIZATION BY STEAM INJECTION

William M. Hildebolt, Mickleton; Murray T. Hundt, Maple Shade, and Robert E. Small, Voorhees, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,556
Int. Cl.[2] A23J *1/00*
U.S. Cl. 426—511 **14 Claims**



1. A method for producing texturized protein in the form of large diceable chunks, said method comprising:

a. mixing untextured protein material and water to form a slurry, said protein material containing at least 70% protein on a dry weight basis, said slurry containing about 40 to 50% solids;

b. injecting a heated gaseous stream into said slurry to propel the protein material into and through a confined treating zone, said heated gaseous stream being at a temperature sufficient to maintain the temperature in said confined zone in the range of about 310° to about 350° F., whereby said protein material is rendered to a thermoplastic state and texturized during its passage through said confined zone;

c. passing said thermoplastic protein material in said confined zone through means for agglomerating and stretching said protein material;

d. transferring said texturized thermoplastic protein material out of the confined treating zone through a means for maintaining back pressure disposed at the discharge end of said confined zone, said transferring effected just after the passage of said protein material through said means for agglomerating and stretching, said means for maintaining back pressure maintaining a pressure of from about 60 to about 80 psi in said confined zone, said means for maintaining back pressure further gently removing large diceable chunks of texturized thermoplastic protein material from said confined zone; and

e. recovering said large diceable chunks of texturized protein in a collection zone.

4,038,433

METHOD FOR PROCESSING SOFT VEGETABLE FOODSTUFFS INTO CRUMBS

Josef Manser, Uzwil, and Friedrich Egger, Niederuzwil, both of Switzerland, assignors to Gebrueder Bühler AG, Uzwil, Switzerland

Division of Ser. No. 600,112, July 29, 1975. This application Mar. 8, 1976, Ser. No. 664,804
Int. Cl.[2] A23L *1/195, 1/100*
U.S. Cl. 426—615 **22 Claims**

1. A method of continuously processing soft and moist vegetable foodstuffs, particularly vegetables having a high moisture content, comprising the steps of subjecting the moist vegetables to a pronounced compressing, kneading and attendant first homogenizing action to form a mass of fragmentized vegetables; subsequently comminuting said mass including subdividing said mass into a plurality of smaller batches and severing the batches to form a plurality of fragments while homogenizing the fragmentized material by reforming the same into a continuous mass; and subsequently dividing the reformed continuous mass into discrete crumbs.

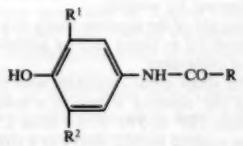
4,038,434

ANTIOXIDANT STABILIZED EDIBLE COMPOSITIONS

David W. Young, Homewood, Ill., assignor to Howard Hall & Company, Cos Cob, Conn.

Filed Mar. 12, 1976, Ser. No. 666,438
Int. Cl.[2] A23L *3/34*
U.S. Cl. 426—544 **12 Claims**

1. A composition of matter normally subject to oxidative deterioration comprising an edible organic substance normally subject to oxidative deterioration selected from the group consisting of edible fats, fatty oils, fatty alcohols, fatty acids, and esters of fatty acids, and a minor amount effective as an antioxidant of an N-acyl-2,6-dialkyl-p-aminophenol of the formula



wherein R is hydrogen or an alkyl group having from 1 to about 6 carbon atom and R_1 and R_2 are alkyl groups having from about 4 to 8 carbon atoms and a tertiary α-carbon atom.

4,038,435

FLAVORING AGENT

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament, and Max Stoll, both of Petit-Lancy, all of Switzerland; Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,819

Int. Cl.[2] A23L *1/234*

U.S. Cl. 426—535 67 Claims

1. A composition of matter consisting essentially of a sulfur-containing derivative of pyridine selected from the group of compounds having the general formula:

wherein, when *n* is *o*, R is acetyl; when *n* is 1, r is ethyl or acetyl; and, when *n* is 2, R is furfuryl.

4,038,436

MARGARINE-LIKE PRODUCT HAVING CONTROLLED BROWNING PROPERTIES

Thomas H. Smouse, Plano; James K. Maines, Dallas, and Robert R. Allen, Plano, all of Tex., assignors to Anderson, Clayton & Co., Houston, Tex.

Filed Dec. 21, 1972, Ser. No. 317,420

Int. Cl.[2] A23D *3/00*

U.S. Cl. 426—603 4 Claims

1. In a margarine-like product, the improvement comprising such product containing:

a. between about 0.20 and 0.63% by weight protein selected from a source which is the class consisting of complete milk protein and milk whey, and

b. less than about 2000 parts per million by weight of reducing sugar.

4,038,437

PROCESS FOR THE PRODUCTION OF A MODIFIED PLANT PROTEIN WITH IMPROVED COLOR AND FLAVOR

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,098

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—656 14 Claims

1. A process for producing a modified plant protein having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a plant protein material, said plant protein material containing steam volatile flavor components and at least about 30 percent by weight protein, said slurry having a solids content of from about 3 to about 18 percent by weight;

b. adjusting the pH of the aqueous slurry to a pH in the range of from about 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

c. reacting the alkali metal carbonate with the plant protein by heating the aqueous slurry to a temperature in the range of from 280° to 370° F. for from 2.5 to 5 minutes;

d. cooling the reacted protein slurry to a temperature below 130° F.;

e. adding from 0.3 percent to about 1.5 percent by weight peroxide to the slurry, said peroxide being a member selected from the group consisting of hydrogen peroxide, sodium peroxide, potassium peroxide, calcium peroxide, and magnesium peroxide;

f. mixing the peroxide containing slurry;

g. neutralizing the slurry to a pH within the range of from 6.6 to 7.0 by addition thereto of an edible acid;

h. thereafter, removing the steam volatile flavor components from the slurry by heating the slurry; and

i. drying the neutralized slurry until the moisture content is about 15 percent by weight moisture of lower.

4,038,438

METHOD OF COLORING SYNTHETIC FOOD CASINGS

Matiur Rahman, Champaign, and Harold R. Coleman, Danville, both of Ill., assignors to Tee-pak, Inc., Chicago, Ill.

Filed July 19, 1976, Ser. No. 706,854

Int. Cl.[2] A22C *13/00;* A23L *1/27;* B05D *3/02*

U.S. Cl. 427—385 R 5 Claims

1. In the process for the manufacture of synthetic food casing wherein a tubular casing is formed in the gel state and subsequently dried, the improvement which comprises impregnating the tubular casing, while in the gel state and prior to drying, with a colorant solution containing about 0.10 to about 3.0% by weight caramel and 0 to 5% by weight of a water dispersible cationic thermosetting resin for reaction with the caramel and then drying the casing to effect cross-linking and insolubilization of the caramel whereby permanent coloration is imparted to the casing.

4,038,439

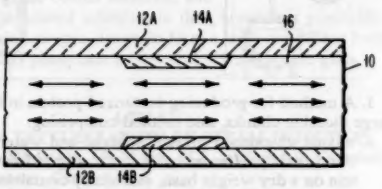
METHOD FOR PRODUCING SELECTED ALIGNMENT IN LIQUID CRYSTAL

Roy Morris Gibson, and Gerard John Sprokel, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,439

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—38 14 Claims



1. A method for producing a surface suitable for forcing a selected alignment in a liquid crystal display cell comprising the steps of

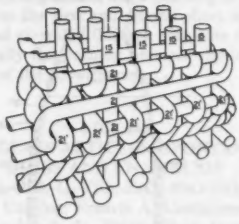
forming free radicals in an r.f. plasma of one species taken from the group of oxygen free radicals and fluorine free radicals, and

exposing a substrate to said free radicals while said substrate is positioned away from said r.f. plasma to form said surface, said surface forcing a parallel alignment with said surface when only said oxygen free radicals are formed, said surface forcing a perpendicular alignment to said surface when said fluorine free radicals are formed.

4,038,440
THREE DIMENSIONAL FABRIC MATERIAL

Robert W. King, Lexington, Mass., assignor to Avco Corporation, Wilmington, Mass.

Division of Ser. No. 220,510, Jan. 24, 1972, Pat. No. 4,001,478, which is a continuation of Ser. No. 675,367, Oct. 16, 1967, abandoned. This application July 19, 1976, Ser. No. 706,849
Int. Cl.[2] D06M 17/00
U.S. Cl. 428—245 10 Claims

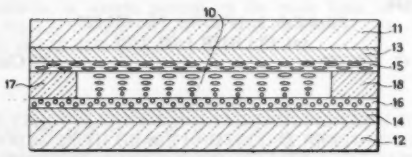


6. A three-dimensional material comprising:
a. a group of filaments oriented parallel to a given axis,
b. a second group of filaments arranged in a planar course, said filaments being woven into said oriented filaments at an angle to said axis,
c. a third group arranged in a plane which overlies and is contiguous with the plane of said second group of filaments, said third group filaments also being woven into said oriented filaments but at an angle to said second group filaments,
d. all of said filaments being sized and spaced relative to each other such that the filaments of each group are in close touching contact with the filaments of each other group, and
e. alternating such second and third groups of filaments in said manner to form a three-dimensional structure.

4,038,441
METHOD OF MANUFACTURING A LIQUID CRYSTAL DEVICE WITH PLANE ALIGNMENT

Jean Claude Dubois, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 535,975, Dec. 23, 1974, abandoned. This application July 8, 1976, Ser. No. 703,661
Claims priority, application France, Dec. 23, 1973, 73.46955
Int. Cl.[2] G02F 1/16, 1/13
U.S. Cl. 427—109 6 Claims

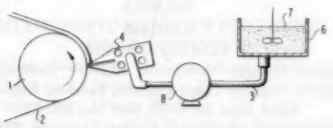


1. A method of manufacturing a liquid crystal device of plane alignment type, comprising the following steps:
A. the deposition upon two transparent substrates which exhibit two large faces, of a first layer of transparent, electrically conductive substance;
B. the treatment of at least one of said substrates in an enclosure made of vitreous silica, the general shape of which is that of a cylinder with a horizontal axis, said enclosure comprising a mounting arrangement along a generatrix of the cylinder, and having a horizontal surface accomodating said substrate, located at half the height of the internal space, said enclosure being surrounded at its central portion by a heater resistor; said treatment comprising the following operations:
a. by means of a tube supplied with a vapor of a liquid monomer selected in the group of methyl acrylate, methyl methacrylate, vinyl monomers, silanes, chlorosilanes and siloxanes, progressively replacing the air of said enclosure by said vapor;
b. adjusting the vapor flow in the enclosure for avoiding turbulence and regulating heating to a predetermined temperature for obtaining a polymer deposit onto said substrate;
c. the insertion of a liquid crystalline substance in the mesomorphous phase, between the two substrates in such a fashion that said polymer deposit is in contact with said crystalline substance.

4,038,442
METHOD FOR COATING

Tadae Utumi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 16, 1975, Ser. No. 613,829
Int. Cl.[2] B05D 5/12, 3/12
U.S. Cl. 427—128 3 Claims



1. A method for coating a thixotropic high viscosity liquid coating composition on a travelling web at a narrow width through an extrusion type hopper, comprising discharging the coating liquid from the hopper onto the travelling web through at least two coating liquid discharge ports arranged side by side in the direction of the width of the web so that the adjacent edges of the coating liquid discharge meet on the web, and drying the coated liquid within such time that a substantially flat cross sectional area results.

4,038,443
DUST ENTRAPMENT COMPOSITION AND METHOD THEREFOR

Charles H. Jacoby, Dalton, Pa., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 337,964, March 5, 1973, Pat. No. 3,896,039. This application May 1, 1975, Ser. No. 573,701
Int. Cl.[2] B05C 1/16
U.S. Cl. 427—136 4 Claims

1. The method of entrapping dust particles in a mine working comprising coating the mine working surfaces with a first mixture consisting essentially of sodium chloride, clay and water to form a crust; then coating the formed crust with a second mixture consisting essentially of sodium chloride, water and a water soluble complex iron cyanide selected from the group consisting of alkali metal ferrocyanide salts, alkaline earth metal ferrocyanide salts, alkali metal ferricyanide salts, and alkaline earth metal ferricyanide salts.

4. The method of regenerating an already formed salt crust formed in a mine working comprising the step of spraying the salt crust with a saturated brine solution heated to an above-ambient temperature.

4,038,444
METHOD OF PRODUCING A METALLIC PLATING

Erwin Steinhauser, Heideweg 1, Diekholzen, and Hans Litwin, Bahnhofstrasse 29, Quackenbruck, both of Germany

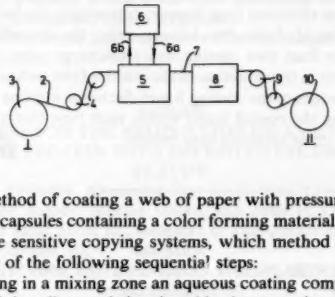
Continuation-in-part of Ser. No. 345,886, March 29, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,645
Claims priority, application Germany, Apr. 15, 1972, 2216275
Int. Cl.[2] B05D 5/06, 3/12
U.S. Cl. 427—261 15 Claims

1. A method of producing a metallic plating comprising the steps of applying to a substrate a settable pasty intimate mixture consisting of a matrix of an aqueous dispersion of a thermosetting synthetic resin binder and Portland cement, the matrix having a multitude of interstices in the interior thereof and metal particles filling the interstices and bound to the matrix, the binder completely surrounding the metal particles and the amount of the metal particles being sufficient to impart a metallic surface character to the applied layer after subsequently smoothing the surface thereof but insufficient to destroy the continuity of the binder, smoothing the surface of the applied mixture before the setting thereof until the metal particles on the surface of the applied layer are pressed together and practically form the entire surface of the layer and the applied layer is substantially dry to the touch, and subsequently permitting the layer to stand at ambient temperature to permit the resin and cement to set.

4,038,445
COATED PAPER

Neil George Douglas Robertson, Marlow Bottom, England, assignor to Wiggins Teape Limited, London, England

Filed June 26, 1975, Ser. No. 590,681
Claims priority, application United Kingdom, July 4, 1974, 29729/74
Int. Cl.[2] B05D 3/12, 3/02
U.S. Cl. 427—150 8 Claims



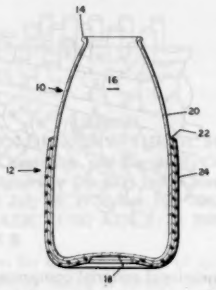
1. A method of coating a web of paper with pressure sensitive microcapsules containing a color forming material, for use in pressure sensitive copying systems, which method consists essentially of the following sequential steps:

a. forming in a mixing zone an aqueous coating composition containing dispersed therein said microcapsules, particulate stilt material of a size greater than that of the microcapsules and in an amount sufficient to protect said microcapsules against premature rupture, and a binder in an amount sufficient to enhance the adhesion of the microcapsules and the particulate stilt material to the web;
b. foaming said composition to impart to it a gas content of at least about 25% and a gas bubble size predominantly in the range of 10 to 100 μm;
c. applying said foamed composition to the web at a coating speed of at least about 250 m/min.;
d. metering the foamed composition on the web by means of a mechanical metering member which is in contact with the foamed coating composition on the web and smooths it to a uniform desired coatweight;
e. returning metered off coating composition to said mixing zone, and
f. drying the metered foamed coating composition on the web.

4,038,446
CONTAINER WITH IMPROVED HEAT SHRUNK CELLULAR SLEEVE

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 9, 1974, Ser. No. 504,111
Int. Cl.[2] B65D 1/02
U.S. Cl. 428—35 22 Claims

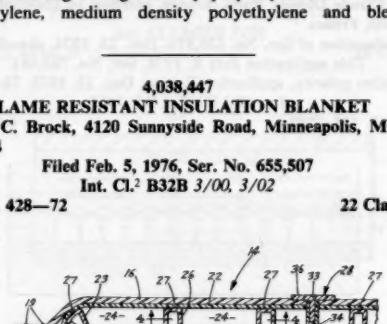


1. A heat shrinkable two layer sleeve shaped article having a major orientation circumferentially of said sleeve and adapted to be telescopically located about the sidewall of a container, and heat shrunk into snug engagement with said sidewall, said article comprising a composite structure consisting essentially of two layers, one of said layers consisting essentially of a closed cellular polyethylene layer and the other of said layers consisting essentially of a noncellular polyethylene layer in adhering contact with said cellular layer, said composite structure having been formed by blown bubble coextrusion with a blow up ratio of about 2:1 or less and having a machine direction heat shrinkage of at least 50% and a cross direction heat shrinkage of 20% or less, the heat shrinkage of said sleeve in the circumferential direction corresponding to the machine direction heat shrinkage and the heat shrinkage of said sleeve in the axial direction corresponding to the cross direction heat shrinkage, said polyethylene of said cellular and said non-cellular layer being independently selected from the group consisting of high density polyethylene, low density polyethylene, medium density polyethylene and blends thereof.

4,038,447
FLAME RESISTANT INSULATION BLANKET

Wayne C. Brock, 4120 Sunnyside Road, Minneapolis, Minn. 55424

Filed Feb. 5, 1976, Ser. No. 655,507
Int. Cl.[2] B32B 3/00, 3/02
U.S. Cl. 428—72 22 Claims



1. An insulation blanket for covering concrete comprising: an elongated generally flat and flexible core of insulating material, said core having a first sheet member and a second sheet member, said second sheet member having a plurality of cup-shaped portions and being secured to the first sheet member to define separate chambers containing a gas, cover means located around said core to confine the core within the cover means, said cover means including a first flexible sheet member

located adjacent one side of the core and a second flexible sheet member located adjacent the other side of the core, said first and second sheet members of the cover means comprising flame resistant sheet material, connecting means attaching spaced portions of the outer peripheral edges of the first and second sheet members of the cover means together to enclose the core within the cover means, said first and second sheet members being unattached at their peripheries between said connecting means thereby allowing moisture and air to flow out from between the sheet members of the cover means between said connecting means, and a plurality of holding assemblies mounted on the first and second sheet members of the cover means and extended through said core for holding the core in a generally flat position between the first and second sheet members of the cover means.

4,038,448

COMPOSITE GLASS ARTICLES, SPONTANEOUS OPAL GLASS AND ENAMEL OF Li_2O-B_2O_3-TiO_2-ZrO_2-PbO-SiO_2

David C. Boyd, Corning; Francis A. Cantaloupe, Horseheads; William H. Dumbaugh, Jr., Painted Post; James E. Flannery, Corning; Louis M. Holleran, Painted Post; Sylvester R. Sandor, and Dale R. Wexell, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 4, 1976, Ser. No. 692,957

Int. Cl.[2] B32B *7/02;* **C03C** *5/02*

U.S. Cl. 428—212 **11 Claims**

1. A composite article consisting of an opal glass body exhibiting a dense, milky-white appearance and an adherent enamel demonstrating high gloss and exceptional chemical durability, said opal glass consisting essentially, in weight percent on the oxide basis, of about 8–13% Na_2O, 5–9% Al_2O_3, 74–78% SiO_2, and 3.5–4.5% F as analyzed, and said enamel having a flux composition being essentially free from alkali metal oxides other than Li_2O and consisting essentially, in weight percent on the oxide basis, of about 0.5–3% Li_2O, 4–8% B_2O_3, 1–5% TiO_2, 3–8% ZrO_2, 45–55% PbO, and 28–38% SiO_2, wherein opal glass exhibits softening point in excess of 760° C., a strain point in excess of 490° C., and a coefficient of thermal expansion (0°–300° C.) of about $66–75 \times 10^{-7}$/° C, and wherein said enamel flux exhibits a coefficient of thermal expansion (25°–300° C.) about 3–10 points lower than that of said opal glass, a lead release after chemical attack of less than 2 $\mu g/cm^2$, and will fire to a high gloss in less than about ten minutes at temperatures below 720° C.

8. An enamel having a flux composition essentially free from alkali metal oxides other than Li_2O which exhibits a coefficient of thermal expansion (25°–300° C.) of about $57–70 \times 10^{-7}$/° C., a lead release after chemical attack of less than about 2 $\mu g/cm^2$, and will fire to a high gloss in less than about 10 minutes at temperatures below 720° C., said flux consisting essentially, in weight percent on the oxide basis, of about 0.5–3% Li_2O, 4–8% B_2O_3, 1–5% TiO_2, 3–8% ZrO_2, 45–55% PbO, and 28–38% SiO_2.

4,038,449

POLYPROPYLENE OR POLYMETHYLPENTENE FILM COATED WITH GRAFT UNDERCOAT MIXTURE AND VINYLIDENE CHLORIDE COPOLYMER TOP COATING

Koichi Uemura, Toyonaka; Tetsuo Ishihara, and Shigeyuki Takahashi, both of Amagasaki, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

Filed Dec. 22, 1975, Ser. No. 643,371

Claims priority, application Japan, Dec. 27, 1974, 50-3633; Feb. 6, 1975, 50-15698

Int. Cl.[2] B32B *31/00*

U.S. Cl. 428—220 **5 Claims**

1. A polypropylene or poly-4-methylpentene-1 film coated with

I. an undercoating consisting essentially of a mixture of

a. a graft polymer of chlorinated polypropylene, as the backbone polymer, having grafted thereto from 2 to 30 percent by weight, based on the weight of the graft polymer, of either a chlorinated vinyl monomer or a styrene monomer,

wherein said chlorinated polypropylene has a chlorine content of from 15 to 55 percent by weight and has an intrinsic viscosity of from 0.3 to 3.0 dl/g, wherein intrinsic viscosity is determined by measuring the viscosity of a solution of 0.2 to 0.5 percent by weight of said chlorinated polypropylene in decalin at 135° C, wherein said chlorinated vinyl monomer contains from 50 to 100 percent by weight of vinyl chloride, vinylidene chloride, or mixtures thereof, and the balance is a vinyl monomer or a mixture of vinyl monomers copolymerizable with vinyl chloride or vinylidene chloride, wherein said styrene monomer contains 50 to 100 percent by weight of styrene, or nucleus-substituted styrene, or α-hydrogen substituted styrene, or mixtures thereof, and the balance is a vinyl monomer or a mixture of vinyl monomers copolymerizable with said styrene monomer,

b. acrylonitrile-butadiene rubber; wherein the weight ratio of *a/b* is from 95/5 to 5/95, and

c. zero to 70 percent by weight of said chlorinated polypropylene, and,

II. a top coating consisting essentially of a vinylidene chloride copolymer containing from 80 to 95 weight percent of vinylidene chloride monomer units.

4,038,450

THIXOTROPIC AQUEOUS POLYIMIDE COMPOSITIONS

Maurice Balme, Sainte-Foy-les-Lyon; Jean Gattus, La Mulatiere, and Bernard Gerard, Lyon, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 190,815, Oct. 20, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,881

Claims priority, application France, Oct. 23, 1970, 70.38362; June 24, 1971, 71.23066

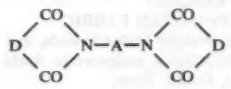
Int. Cl.[2] C08G *69/00;* **B32B** *17/02*

U.S. Cl. 428—268 **16 Claims**

1. A storage-stable composition which consists essentially of a thixotropic solid suspension of:

a. a prepolymer having a particle size of less than 100 microns obtained by reacting, as the sole reactants, a N,N'-bis-imide of an unsaturated dicarboxylic acid of general formula:

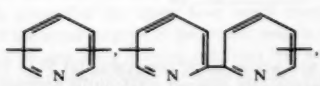
(I)



in which D represents a divalent organic radical containing a carbon-carbon double bond derived from an anhydride of an ethylenic dicarboxylic acid of general formula:

(III)

and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or a radical of formula:



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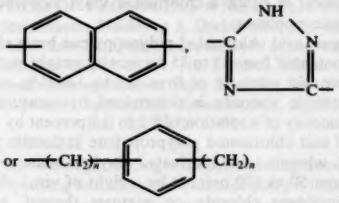


wherein *n* represents an integer of from 1 to 3, or several phenylene or cyclohexylene radicals linked to one another by a valency bond or an inert atom or group, and a polyamine of general formula:

$R(NH_2)_x$

in which *x* represents an integer at least equal to 2 and R represents an organic radical of valency *x* selected from a divalent radical as defined under A, a polyvalent benzene, naphthalene, pyridine or triazine radical or several benzene nuclei linked to one another by a valency bond or an inert atom or group, the bis-imide being used in an amount from 0.55 to 25 mols per mol of $-NH_2$ group introduced by the polyamine, suspended in:

b. water.

4,038,451

COMPOSITIONS COMPRISING POLYALKYLENEPOLYAMINES AND A MIXTURE OF MONO- AND DIAMMONIUM PHOSPHATES AS FIRE RETARDANTS FOR CELLULOSIC SUBSTRATES

Frederick L. Brown, Midland, Mich., and James L. Potter, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 29, 1975, Ser. No. 617,359
Int. Cl.[2] B32B *7/00, 23/00*
U.S. Cl. 428—274 **10 Claims**

1. A composition comprising a polyalkylenepolyamine having a number average molecular weight between about 1,000 and about 100,000 and a mixture of monoammonium phosphate and diammonium phosphate.

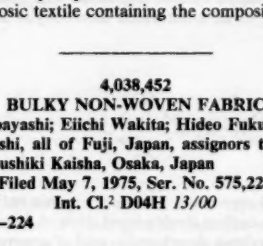
7. A cellulosic textile containing the composition described by claim **1.**

4,038,452

BULKY NON-WOVEN FABRIC

Tadahiro Kobayashi; Eiichi Wakita; Hideo Fukuda, and Yukio Matsubayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1975, Ser. No. 575,226
Int. Cl.[2] D04H *13/00*
U.S. Cl. 428—224 **5 Claims**



1. A bulky non-woven fabric comprising (a) 50 to 95% by weight of spontaneously crimped acrylonitrile polymer fibers having lengths of 4mm to 20mm and at least 20 crimps per inch of length, said acrylonitrile polymer fibers consisting essentially of, in polymerized form, 80 to 100% by weight of acrylonitrile and 0 to 20% by weight of at least one copolymerizable monoethylenically unsaturated monomer, and (b) 5 to 50% by weight of fibrillated fibers of at least one acrylonitrile polymer, said acrylonitrile polymer comprising, in polymerized form, 60 to 98% by weight of acrylonitrile and 2 to 40% by weight of at least one copolymerizable monoethylenically unsaturated monomer having a carboxyl group or an amide or N-alkyl substituted amide group, said non-woven fabric being in the form of a web having a structure such that said spontaneously crimped acrylonitrile polymer fibers are entangled with each other and are caught in and adhere to the fibrils of said fibrillated acrylonitrile polymer fibers, and having an apparent density of 0.05 to 0.25 g/cm^3.

4,038,453

LEADER STRIP FOR MOTION PICTURE FILM

Thomas J. Loran, Boulder; Virgil R. Friebel, Longmont, and Robert P. Pardee, Boulder, all of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Sept. 15, 1975, Ser. No. 613,719
Int. Cl.[2] B32B *27/14, 5/16*
U.S. Cl. 428—325 **2 Claims**

1. A leader strip for motion picture film capable of removing gum or accumulation of materials deposited upon motion picture equipment, consisting of a flexible strip capable of being passed through an apparatus having a mechanism for moving motion picture film therethrough, said strip being made of a composition selected from the group consisting of cellulose esters and polyesters, said strip having bonded upon at least one surface thereof a gum-removing layer, said layer comprising an organic binder, said organic binder being a member selected from the group consisting of cellulose nitrate, cellulose acetate, cellulose acetate-butyrate, cellulose acetate-propionate, polyurethanes, polyacrylonitriles, copolymers of acrylonitrile and vinylidene chloride, epoxy resins and mixtures thereof, and a gum-shearing agent of finely divided polymeric particles evenly dispersed and anchored to the surface by said binder, said polymeric particles being a member selected from the group consisting of polyesters, polyamides, polyimides, and polyolefins, said particles having a diameter less than about five mils and being substantially spheroidal in shape wherein said gum-shearing agent is about 0.1 to about 10 percent by weight of the total gum removing layer and the thickness of said gum removing layer is in the range of about 1 to 1.5 mils.

4,038,454

PRESSURE SENSITIVE ADHESIVE COATED SHEET MATERIAL

G. W. Horst Lehmann, and H. A. Julius Curts, both of Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Continuation of Ser. No. 315,990, Dec. 18, 1972, abandoned, which is a continuation of Ser. No. 85,762, Oct. 30, 1970, abandoned, which is a division of Ser. No. 8,033, Feb. 2, 1970, Pat. No. 3,563,953, which is a continuation-in-part of Ser. No. 549,468, May 12, 1966, abandoned. This application Sept. 16, 1974, Ser. No. 505,999
Claims priority, application Germany, May 19, 1966, 82010
Int. Cl.[2] C09J *7/04;* **C08L** *33/08*
U.S. Cl. 428—356 **6 Claims**

1. A pressure-sensitive adhesive-coated sheet material cured in the presence of from 0.05 to 5% of zinc chloride at 60°–100° C., which is resistant to the action of solvents, heat and weather and which at the same time possesses good "quick-stick" properties, comprising a flexible backing having bonded thereto a pressure-sensitive adhesive material in the form of a cured coating of a copolymer having a K-value of from 82 to about 100 (determined from a 1% solution of the

copolymer in toluene) said copolymer obtained by solution polymerization being a copolymer of monomers consisting essentially of:

a. 100 parts by weight of a mixture composed of approximately equal parts of 2-ethylhexyl acrylate and n-butyl acrylate, and

b. between 0.25 and 4 parts by weight of at least one ethylenically unsaturated monomer selected from the group consisting of glycidyl acrylate and glycidyl methacrylate, said percentage of zinc chloride being based on the weight of the copolymer.

4,038,455

PROCESS FOR IMPROVING THE ADHESION OF POLY-1,3,4-OXADIAZOLE FILAMENTS TO RUBBER

Matthias Johann Wampetich, Chur, Crisons, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Apr. 28, 1975, Ser. No. 572,103

Claims priority, application Switzerland, May 13, 1974, 6477/74

Int. Cl.² C08G 33/04; C09J 3/12

U.S. Cl. 428—378 **17 Claims**

1. A process for the improvement of adhesion to rubber of aromatic poly-1,3,4-oxadiazole filaments which process comprises applying to said filaments at least one adhesion agent taken from the class consisting of compounds having at least one N-glycidyl group, and fixing said agent on said filaments.

4,038,456

AZIDO-SILANE COMPOSITIONS

James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 483,365, June 26, 1974, Pat. No. 3,944,574. This application Oct. 28, 1975, Ser. No. 626,041

Int. Cl.² B32B 9/00

U.S. Cl. 428—391 **15 Claims**

1. An article of manufacture comprising a material selected from the group consisting of siliceous materials, metals, metal oxides and organic polymers coated with a solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a non-aqueous solvent

a. An azido-containing carboxylic acid halide of the formula

$$(N_3X)_a—Ar—(R)_n—COHal$$

wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, a is an integer of from 1 to 2, Ar is an aryl radical, R is a divalent akylene radical having from 1 to 17 atoms, wherein n has a value of 0 or 1; and Hal represents a halogen radical, with (b) an amino-containing silane having the formula

$$R'—Si(R^2_b)—Y_{3-b}$$

wherein R^2 is a monovalent hydrocarbon radical, b has a value of 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals and wherein R' is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom which has a hydrogen atom bonded directly to it, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

4,038,457

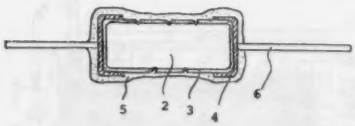
FUSIBLE METAL FILM RESISTOR

Terukazu Kinugasa, Hirakata, and Hyogo Hirohata, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 12, 1976, Ser. No. 657,627

Int. Cl.² B32B 9/04

U.S. Cl. 428—411 **8 Claims**



1. A fusible metal film resistor comprising a substrate of an electrically insulating material and a resistive film formed on said substrate, said resistive film consisting essentially of nickel, 4 to 12 weight % of phosphorus, and 0.05 to 10 weight % of at least one member selected from the group consisting of iron, tin, manganese and bismuth.

8. A fusible metal film resistor according to claim **1** wherein said substrate is ceramic or glass.

4,038,458

ZINC-AIR ELECTROCHEMICAL CELL

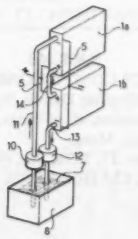
Jean Jacquelin, Marolles en Hurepoix, France, assignor to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Jan. 12, 1976, Ser. No. 648,233

Claims priority, application France, Jan. 14, 1975, 75.00966

Int. Cl.² H01M 8/04

U.S. Cl. 429—15 **8 Claims**



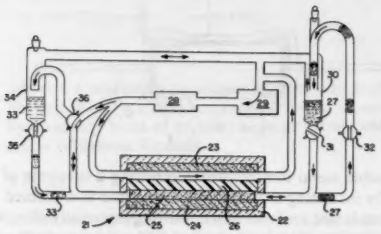
1. An electrochemical cell of the type comprising several elements fed with an electrolyte solution comprising an active material in suspension and more particularly zinc powder, conveyed by forced flow in the said elements, those elements being grouped together into modules and electrically connected together in series and fed said solution in series within each of the said modules, said electrochemical cell including at least one unitary cell block comprising two substantially identical modules arranged one above the other, electrically interconnected in parallel the module situated at the upper level receiving said electrolytic solution at the input of its upper element, said solution after having passed through the said module situated at the upper level being transferred to the input of the upper element of the second module situated at the lower level and lastly flowing out from that second module after having passed through the latter through the output of its lower element.

4,038,459

HALOGEN COMPLEXING ALCOHOLS AND NITRILES

Alfred M. Ajami, Boston; Fraser M. Walsh, Arlington, and Dennis N. Crouse, Melrose, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,590
Int. Cl.[2] H01M *8/08, 4/60*
U.S. Cl. 429—15 **24 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, polyhalogen complexes, and mixtures thereof as its electrochemically active agent, said process comprising adding to the electrolyte of said system an additive comprising an alcohol or nitrile, which exists as a relatively insoluble liquid in aqueous metal halide solutions at 30° C in the presence of one and more than one molar equivalent of halogen for every alcohol or cyano group in the additive, said additive being selected from the group consisting of compounds having the formulae:

$$Z(-R-CN)_m$$

$$Z(-R-OH)_m$$

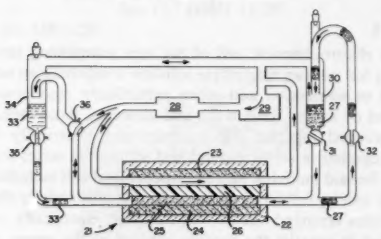
where R is an aliphatic group containing 1 to 8 carbon atoms, m is a number from 1 to 6, and Z is any chemical functionality which does not render the additive's halogen complex crystalline at 30° C.

4,038,460

HALOGEN COMPLEXING ETHERS

Fraser M. Walsh, Arlington; Dennis N. Crouse, Melrose, and Alfred M. Ajami, Boston, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,685
Int. Cl.[2] H01M *8/08, 4/60*
U.S. Cl. 429—15 **23 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, polyhalogen complexes, and mixtures thereof as its electrochemically active agent, said process comprising adding to the electrolyte of said system an ether additive which exists as an insoluble liquid in aqueous metal halide solutions at 30° C in the presence of one or more molar equivalents of halogen per ether oxygen in the ether, said additive being selected from the group consisting of compounds aving the formulae:

a. $(R\text{-}X\text{-}R')_{n'}Z$;
b. $Z(\text{-}R\text{-}X\text{-}R'\text{-})_{n}Z'$;
c. $Z'(\text{-}R\text{-}X\text{-}R'\text{-})_{n}Z(\text{-}R\text{-}X\text{-}R'\text{-})_{n''}Z(\text{-}R\text{-}X\text{-}R'\text{-})_{n}Z'$;
d. $Z[(\text{-}R\text{-}X\text{-}R'\text{-})_{n}Z']_{m}$; and

e)

$$\left[(-R-X-R'-)_{n}Z\right]_{m},$$

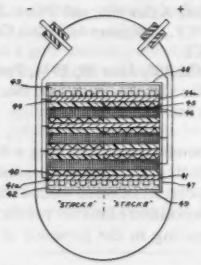
where R may equal R', Z may equal Z', R and R' are aliphatic groups containing 1 to 8 carbon atoms, n, n', and n'' are numbers from 1 to 100, m is a number from 1 to 6, Z and Z' are chemical groups which do not render the additive's halogen complex crystalline at 30° C and are incpable of substantial irreversible combination with bromine, chlorine, or iodine, and X is selected from the group consisting of an oxygen atom, H-C-OR", R"'-C-OR", and combinations thereof, wherein R" and R"' are aliphatic groups containing 1 to 6 carbon atoms.

4,038,461

ELECTROCHEMICAL CELL HAVING BALANCED DISTRIBUTION OF OXYGEN AND ELECTROLYTE

Don R. Warnock, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,954
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—21 **4 Claims**



1. An improved electrochemical cell having a plurality of anodes, cathodes, electrolyte reservoirs, separators, gas flow spaces, and an electrolyte, in a sealed gas containing enclosure with the anodes electrically connected to a negative terminal and the cathodes connected to a positive terminal, the said improvement comprising:

a. a plurality of circular disc anodes having opposing faces;
b. a plurality of circular disc cathodes having opposing faces;
c. a plurality of circular disc electrolyte reservoirs;
d. a plurality of semicircular half-disc separators having opposing faces;
e. a plurality of semicircular half-disc gas flow spaces having opposing faces;
f. means for pairing and positioning each of the said plurality of semicircular separators and the said semicircular gas flow spaces in one-to-one relationship to provide a plurality of circular disc separator-flow space elements;
g. means for stacking the said circular elements in the consecutive repetitive order of anode, separator-flow space, cathode, separator-flow space, and repeat, the said stack

having an anode at the top and bottom of the stack, and the elements arranged such that approximately one-half of each of the said faces of each cathode is adjacent to a separator face and the other half of each of the said cathode faces is adjacent to a gas flow space such that the area of each cathode face adjacent to the said separator face is opposite (through the cathode) the area of the said cathode face which is adjacent to the said gas flow space face, and approximately one-half of each of the said faces of each anode is positioned adjacent to a said separator face and the other half of each of the said anode faces is adjacent to a said gas flow face, such that each said separator has an adjacent anode face and an adjacent cathode face opposite each other across the separator;

h. means for positioning the said electrolyte reservoirs at the top and bottom ends of the said stack adjacent the said anodes; and

i. an electrolyte entrainment barrier comprising a porous hydrophabic plastic membrane enclosing and contacting said stack.

4,038,462

SOLID-ELECTROLYTE BATTERY, PARTICULARLY FOR THE STORAGE OF ELECTRICAL ENERGY

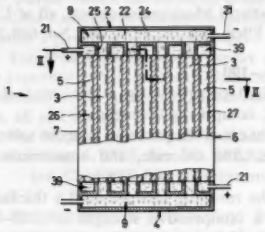
Franz-Josef Rohr, Abtsteinach, Germany, assignor to BBC Brown Boveri & Company Limited, Mannheim, Germany

Filed Mar. 29, 1976, Ser. No. 671,335

Claims priority, application Germany, Mar. 27, 1975, 2513649

Int. Cl.[2] H01M *6/18*

U.S. Cl. 429—30 **8 Claims**



1. Solid-electrolyte battery for the storage of electric power with a large number of anode and cathode spaces forming electrode spaces arranged parallelly in straight channels attached to collecting spaces and alternately disposed in an ion conducting body of solid electrolyte so that the electrode spaces have adjacent electrode spaces of opposite polarity wherein the anode spaces comprise a first set of hollow recesses in the body of the solid electrolyte forming anode channels closed at one end and open at the other end to a first collecting space disposed in the body of the solid electrolyte and the cathode spaces comprise a second set of hollow recesses in the body of the solid electrolyte forming cathode channels closed at one end and open at the other end to a second collecting space disposed in the body of the solid electrolyte, the first and second collecting spaces having a locking lid.

4,038,463

ELECTRODE RESERVOIR FOR A FUEL CELL

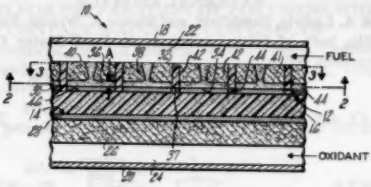
John H. Lamarine, Coventry; Robert C. Stewart, Jr., Granby, and Raymond W. Vine, Bolton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,875

Int. Cl.[2] H01M *8/02*

U.S. Cl. 429—44 **17 Claims**

1. An electrolyte reservoir layer for use adjacent the catalyst layer of a fuel cell, said reservoir layer being porous and including a catalyst facing surface and a noncatalyst facing surface, said catalyst facing surface including first impregnations of hydrophobic material to a shallow depth over a major portion of its area, said catalyst facing surface also including uniformly distributed areas not impregnated with hydrophobic material, said reservoir layer also including uniformly distributed nonelectrolyte retaining portions leading from said noncatalyst facing surface to said impregnations of hydrophobic material at said other surface, said nonelectrolyte retaining



portions comprising only a small portion of the volume of said reservoir layer, said reservoir layer being hydrophilic in all portions other than said nonelectrolyte retaining portions and said first impregnations, said reservoir layer also including impregnations of an electrolyte retaining matrix material extending from said areas of said catalyst facing surface not impregnated with hydrophobic material into said hydrophilic portions, said matrix material impregnating less than half of said hydrophilic portions.

4,038,464

SODIUM-SULFUR BATTERY AND PROCESS FOR ITS PRODUCTION

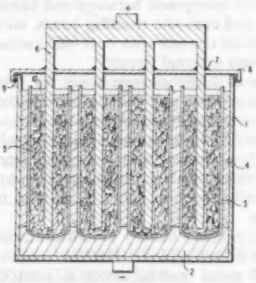
Werner Baukal, Ringstrasse 1, 6242 Kronberg; Reinhard Knodler, Vorstadt 27, 6239 Diedenbergen, and Wolfgang Hermann Kuhn, Oberhochstadter Weg 13, 6 Frankfurt am Main, all of Germany

Filed Nov. 26, 1975, Ser. No. 635,657

Claims priority, application Germany, Nov. 27, 1974, 2456018; Nov. 27, 1974, 2456021

Int. Cl.[2] H01M *10/04*

U.S. Cl. 429—104 **7 Claims**



1. A rechargeable galvanic battery which is comprised of liquid sodium, as the negative electro-chemically active material, liquid sulfur, as the positive electro-chemically active material, and a ceramic solid electrolyte, which is capable of conducting sodium ions, said sodium being completely absorbed in a fine-pored metal felt or mat and said sulfur being completely absorbed in a graphite felt or mat, said metal felt having open pores which face toward said solid electrolyte, the pore structure of said metal felt being undisturbed even in the transition area between said metal felt and said solid electrolyte, said metal felt filling the entire anode space of said

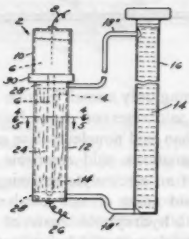
battery, and, at least at the operating temperature of said battery, an intimate contact over a large surface area existing between said metal felt and said solid electrolyte and the maximum distance between said metal felt and said solid electrolyte being in the order of the magnitude of said pore width of said metal felt.

4,038,465

SODIUM SULFUR BATTERY OR CELL WITH EXTERNAL STORAGE

Frank A. Ludwig, Southfield, and Steven A. Weiner, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 11, 1975, Ser. No. 630,876
Int. Cl.² H01M 4/36
U.S. Cl. 429—104 **23 Claims**



1. A secondary battery or cell comprising:

A. One or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. One or more cathodic reaction zones containing (1) a cathodic reactant comprising a liquid electrolyte which is electrochemically reversibly reactive with said anodic reactant and which, when said cell or battery is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two-phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (2) an electrode in contact with said liquid electrolyte;

C. One or more cation-permeable barriers to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said electrode being in electrical contact with both said cation-permeable barrier and said external circuit;

D. One or more storage zones for said liquid electrolyte separate from said one or more cathodic reaction zones but connected thereto; and

E. Means for flowing said liquid electrolyte by free convective flow from at least one of said storage zones, through said one or more cathodic reaction zones, and out of said cathodic reaction zones to at least one of said storage zones.

16. A secondary battery or cell comprising:

A. One or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. One or more cathodic reaction zones containing (1) a cathodic reactant comprising a liquid electrolyte which is electrochemically reversibly reactive with said anodic reactant and which, when said cell or battery is at least partially discharged, is elected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two-phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (2) an electrode in contact with said liquid electrolyte;

C. One or more cation-permeable barriers to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said electrode being in electrical contact with both said cation-permeable barrier and said external circuit;

D. Two or more storage zones for said liquid electrolyte separate from said one or more cathodic reaction zones but connected thereto; and

E. Means for flowing said liquid electrolyte from at least one of said storage zones through said one or more cathodic reaction zones and out of said cathodic reaction zones to at least one of said storage zones, said means comprising 1) at least two conduits connecting at least two of said storage zones with said one or more cathodic reaction zones and 2) means for adjusting pressure on said liquid electrolyte within such storage zones so as to induce reciprocating flow between said storage zones and through said one or more cathodic reaction zones.

4,038,466

METHOD OF PRODUCING THICKENED ELECTROLYTE FOR PRIMARY CELL

Leonid Lavrentievich Belyshev, ulitsa Akademika Komarova, 19a, kv. 52; Albert Vladimirovich Chuvpilo, ulitsa Novo-Alexeevskaya, 48, korpus 37, kv. 281; Valentina Vladimirovna Trizno, ulitsa Bazhova, 15, korpus 1, kv. 215; Viktor Arsenievich Naumenko, ulitsa Novo-Axexeevskaya, 48, korpus 37, kv. 28; Lidia Fedorovna Penkova, 3 Mytischinskaya ulitsa, 14, kv. 124, all of Moscow; Veniamin Ivanovich Gorokhov, ulitsa 2 Novo-Proletarskaya, 1, kv. 4, Moskovskaya oblast Pushkinsky raion, poselok Pravdinsky; Evgenia Grigorievna Apirina, ulitsa Botanicheskaya, 17, kv. 7, Moscow, and Sarra Abramovna Gantman, ulitsa B. Rupasovskaya, 15, korpus 16, kv. 17, Mytischi Moskovskoi oblasti, all of U.S.S.R.

Filed Aug. 27, 1975, Ser. No. 608,201
Int. Cl.² H01M 6/22
U.S. Cl. 429—190 **5 Claims**

1. A method of producing a thickened electrolyte for a primary cell, comprising the steps of:

a. mixing, at room temperature, aqueous solutions of calcium chloride, zinc chloride, and ammonium chloride with chromium sulphate and starch;

b. aging the resulting mixture until a thickened electrolyte having a compressive strength of 0.05–0.85 kg/cm² is formed; and

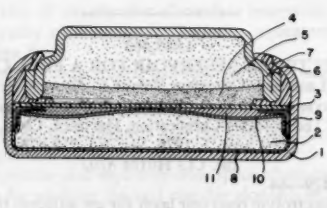
c. pressing said thickened electrolyte through at least one drawhole at a rate of at least 0.05 m/sec, the resulting viscosity of said electrolyte being sufficient for the application of a layer of said thickened electrolyte to the negative electrode of said cell.

4,038,467

GALVANIC CELL

Hans-Martin Lippold, Glashutten, and Dieter Spahrbier, Fischbach, Taunus, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Feb. 5, 1976, Ser. No. 655,485
Claims priority, application Germany, Feb. 15, 1975, 2506399
Int. Cl.² H01M 6/02
U.S. Cl. 429—219 **13 Claims**



1. A galvanic cell having a negative zinc electrode, a posi-

tive electrode of bivalent silver oxide, and alkaline electrolyte, and a positive current take-off connector, said cell being characterized in that:

the positive electrode has a surface reduced from bivalent silver oxide to univalent silver oxide so that the cell has the discharge potential of the Ag_2O/Zn-system;

an electrically non-conducting plastic layer is positioned to insulate the bivalent silver oxide from the positive current take-off connector; and

a porous silver layer is positioned to provide electrical contact between the bivalent silver oxide and the connector,

said porous layer facing the counter electrode and being connected via a porous layer of the univalent silver oxide with the bivalent silver oxide.

4,038,468

PHOTOSENSITIVE POLYMERIC MATERIAL AND ELECTROPHOTOMETRIC MATERIAL AND METHODS OF MANUFACTURING SAME

Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 6; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37, kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyaus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnjus; Larisa Vasilievna Randina, prospekt Lenina, 30, Tomsk; Svetlana Leonidovna Bocharova, prospekt Lenina, 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina, 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina, 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20, kv. 82, Vilnjus, and Yanina Antono Adomanite, ulitsa Antokalne, 96, kv. 75, Vilnjus, all of U.S.S.R.

Division of Ser. No. 307,224, Nov. 16, 1972, abandoned. This application Aug. 6, 1975, Ser. No. 602,524

Int. Cl.[2] C08F *126/06*

U.S. Cl. 526—11.1 **5 Claims**

1. A method for preparing a poly-N-vinyl heterocyclic secondary amine comprising reacting in a medium of an organic solvent a heterocyclic secondary amine selected from the group consisiting of phenothiazine, phenoxazine, indole, carbazole and the chloro, bromo, methyl, nitro and acetyl derivatives of carbazole with a vinyl ether selected from the group consisting of vinyl methyl, vinyl ethyl, vinyl propyl and vinyl butyl ethers in the presence of a strong acid.

4,038,469

AQUEOUS INSOLUBLE POLYMERS CONTAINING A PLURALITY OF DIAZOMETHYLENE GROUPS

Derek Walker, Windermere, and Philip Howard Chapman, Ulverston, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed July 30, 1974, Ser. No. 493,051

Claims priority, application United Kingdom, July 31, 1973, 36384/73

Int. Cl.[2] C08F *210/00;* **C08C** *19/22, 19/12;* **C08G** *2/00*

U.S. Cl. 526—19 **5 Claims**

1. An aqueous insoluble polymer possessing a plurality of diazomethylene groups wherein each diazomethylene group either forms part of the polymer backbone chain or forms part of a side chain attached to the polymer backbone chain in which case one of the valencies of each diazomethylene group is linked to the polymer backbone chain and the other valency is bonded to an organic substituting group selected from the group consisting of (i) alkyl containing 1–20 carbon atoms, (ii) cycloalkyl containing 5–7 carbon atoms, (iii) aryl, (iv) aralkyl containing 1–6 carbon atoms in the alkyl portion, (v) 5- or 6-membered heterocyclic rings containing one or more hetero atoms selected from O, N and S, (vi) alkyl of 1–6 carbon atoms substituted by a heterocyclic ring as defined in (v), (vii) alkenyl of up to 6 carbon atoms, (viii) cycloalkenyl of 5–7 (ix) alkenyl of up to 6 carbon atoms substituted by aryl or a heterocyclic ring as defined in (v) or any of groups (i)–(ix) substituted by one or more halogen atoms, cyano, nitro, sulphone, oxo, esterified carboxy, C_{1-6} alkyl, or C_{1-6} alkoxy groups.

4,038,470

METHOD FOR PREPARATION OF POLYMERS WHICH CONTAIN N-ACYLLACTAM GROUPS

Jaroslav Stehlicek, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

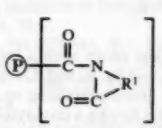
Filed Mar. 18, 1976, Ser. No. 667,943

Claims priority, application Czechoslovakia, Mar. 20, 1975, 1901/75

Int. Cl.[2] C08F *8/00, 8/18, 8/26, 8/40*

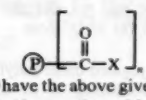
U.S. Cl. 526—29 **4 Claims**

1. Method for preparation of polymers containing N-acyllactam groups of the general formula I



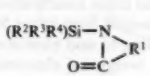
(I)

where R^1 is a bifunctional aliphatic hydrocarbon residue containing 2 to 15 carbon atoms, which may be linear or branched n is an integer and Ⓟ is a n-functional polymeric residue, which may be linear, branched or can form the part of a threedimensional network, wherein the polymers containing acyl halide groups of the general formula II



(II)

where n and Ⓟ have the above given meaning and X is Cl or Br, are subjected to the reaction with a trisubstituted N-silylactam of the general formula III



(III)

where R^1 has the above given meaning and R^2, R^3 and R^4 are the same or different alkyl or aryl groups containing 1 to 7 carbon atoms, in an inert solvent at the temperature −15° C to +100° C, preferably at the temperature 0° C to +30° C, while 1 to 5 molar parts of the trisubstituted N-silyllactan is used per one equivalent of acyl halide groups of the polymer.

4,038,471

METHOD FOR PREPARING HIGH-CIS POLYALKENAMERS

Kenneth F. Castner, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

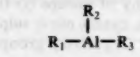
Filed Oct. 29, 1976, Ser. No. 736,810

Int. Cl.[2] C08F *4/78, 32/04, 32/06*

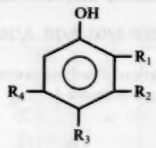
U.S. Cl. 526—142 **6 Claims**

1. The method which comprises polymerizing a cycloolefin selected from the group consisting of cyclooctene and 1,5-cyclooctadiene by subjecting said cycloolefin to a catalyst comprising (A) a tungsten halide salt of the general formula $R_{m-n}WX_n$ wherein X represents chlorine or bromine and R is selected from the group consisting of alkoxy, haloalkoxy, aryloxy, alkaryloxy, and acetyl acetonyl radicals containing up to 20 carbon atoms; m being 6 when X = Cl or 5 when X =

Br; and wherein n may be 3 to 6 inclusive when X = Cl or 3 or 5 inclusive when X = Br and (B) an organoaluminum compound of the formula:



wherein R_1, R_2 and R_3 may independently represent an alkyl or aralkyl radical containing up to 20 carbon atoms or a halogen atom, and (C) a hydroxyl compound which is phenol or o-, m- or p-cresol or which is of the formula ROH wherein R is selected from the group consisting of alkyl, haloalkyl, cycloalkyl, aralkyl and alkoxyalkyl containing up to 20 carbon atoms, and (D) a hindered phenol of the formula



wherein R_1 represents an alkyl group with a tertiary carbon attached to the aromatic ring, and R_2, R_3 and R_4 represent either a hydrogen atom or an alkyl group containing up to 20 carbon atoms, to form polyalkenamers having a cisvinylene content of at least about 85 percent, and wherein the molar ratio of A:B:C:D ranges from 1:2–8:0.5–3:3—24.

4,038,472

NOVEL CURING SYSTEM FOR CONJUGATED DIENE BUTYL ELASTOMERS

James A. Rae, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 25, 1976, Ser. No. 661,286

Int. Cl.[2] C08F *8/00, 8/42, 8/06*

U.S. Cl. 526—48 **9 Claims**

1. A method of curing a conjugated diene butyl elastomeric copolymer, said copolymer consisting of 85 to 99.5% by weight of a C_4–C_7 isoolefin and 15 to 0.5% by weight of a conjugated C_4–C_{14} diolefin, said copolymer having randomly distributed sites of conjugated diene unsaturation and having a number average molecular weight from about 5000 to 500,000, said method comprising adding to said elastomer about 1 to 6 parts per hundred parts by weight of elastomer of 1,4-dihydroxybenzene and a metal carboxylate oxidation catalyst or oxidizing agent or mixture thereof in amounts effective to promote the oxidation of dihydroxybenzene to 1,4-benzoquinone, said benzoquinone crosslinking copolymer chains whereby a crosslinked cured elastomer product is formed, said oxidizing agent only being present when curing temperatures in excess of 200° F. are employed.

4,038,473

PROCESS FOR CLEANING POLYMERIZATION REACTORS

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 15, 1975, Ser. No. 622,679

Int. Cl.[2] C08F *2/20, 14/06*

U.S. Cl. 526—62 **11 Claims**

1. In a process for the aqueous suspension polymerization of a vinylidene halide in reactors containing metal surfaces exposed to said suspension, the improvement comprising conducting said polymerization in reactors wherein said metal surfaces are substantially free of adsorbed organic materials prior to introduction therein of said aqueous suspension into the reactor, whereby the amount of polymer build up on said metal surfaces during polymerization is substantially reduced.

4,038,474

PROCESS FOR PREPARING NOVEL PETROLEUM RESIN EMPLOYING $ALRX_2$ AND ALKYL HALIDE OR HYDROGEN HALIDE

Ken-ichi Kudo; Yoshihiko Kitagawa, and Hideyuki Kuribayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 7, 1975, Ser. No. 565,656

Claims priority, application Japan, Apr. 19, 1974, 49-44690

Int. Cl.[2] C08F *4/52, 10/00, 120/00, 136/00*

U.S. Cl. 526—185 **15 Claims**

1. A process for manufacturing a petroleum resin, characterized by copolymerizing 20 to 80 parts by weight of a so-called spent C_4- or C_5-fraction obtained by removing most of the dienic constituents from the fraction comprising compounds having mainly four or five carbon atoms produced by petroleum cracking and 80 to 20 parts by weight of styrene and/or a styrene derivative with a catalyst system comprising an organoaluminum compound represented by the general formula $AlRX_2$ (wherein R is an alkyl group having 1 to 4 carbon atoms and X is a halogen atom) as main catalyst and an alkyl halide or a hydrogen halide as co-catalyst, in a hydrocarbon solvent at a temperature of 0° to 60° C.

4,038,475

HIGHLY STABLE ANAEROBIC COMPOSITIONS

Elliott Frauenglass, Newington, and Gerhardt P. Werber, Guilford, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation of Ser. No. 506,132, Sept. 24, 1974, abandoned, which is a continuation of Ser. No. 318,132, Dec. 26, 1972, abandoned, which is a continuation of Ser. No. 112,722, Feb. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,795, March 18, 1970, abandoned. This application Aug. 28, 1975, Ser. No. 608,655

Int. Cl.[2] C08F *120/20, 120/34*

U.S. Cl. 526—328 **13 Claims**

1. An anaerobic composition comprising a polymerizable acrylate ester monomer, a peroxy polymerization initiator therefor, as accelerators of free radical polymerization an organic amine and an organic sulfimide, an inhibitor of free radical polymerization selected from the class consisting of guinones having an oxidation-reduction potential of about 0.6 volt or less, said anaerobic composition having added thereto from about 1 to about 1000 parts per million by weight of said anaerobic composition of a soluble chelator having ligand atoms other than nitrogen ligand atoms of the >C=N— type.

4,038,476

PROCESS FOR THE PRODUCTION OF POLY-N-VINYLPYRROLIDONE GRANULES CONTAINING IODIDE

Kaya Atasoy, Munchenstein; Karl Franz Weckwarth, Basle, and Walter Reinhardt, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,027

Claims priority, application Switzerland, Dec. 2, 1974, 15956/74

Int. Cl.[2] C08K *3/16*

U.S. Cl. 528—485 **10 Claims**

1. Process for the production of free-flowing granules consisting essentially of poly-N-vinylpyrrolidone (PVP) and iodide (I^-), the granules being of practically uniform composition and particle size, which process comprises producing

a. a solution or a colloidal suspension of a substance releasing iodide ions, in a first solvent or solvent mixture, as well as

b. a solution or colloidal solution or suspension of PVP in a second solvent or solvent mixture which possesses a surface tension different from that of the first solvent or solvent mixture, and in which PVP is at least partially soluble or wettable, and in which the substance releasing

iodide ions, contained in the first solvent or solvent mixture, is insoluble or only slightly soluble;

combining the solutions or suspensions (a) and (b), with uniform thorough mixing, in small portions to thus form a mixed-phase system; continuing the thorough mixing of the multi-phase mixture; and separating and drying the formed agglomerates containing PVP and iodide.

4,038,477

PROCESS FOR THE PRODUCTION OF POLYOLEFIN POWDER

Hiroshi Inoue, Ohi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1975, Ser. No. 633,597

Claims priority, application Japan, Nov. 29, 1974, 49-136151

Int. Cl.[2] C08F *6/12*; C08C *2/06*

U.S. Cl. 528—487 **10 Claims**

1. A process for the production of a fine polyolefin powder which comprises precipitating the polyolefin from a solution of the said polyolefin in a mixture of a solvent and non-solvent therefor, said mixture having a ratio of solvent to non-solvent in the range of about 95:5 to about 30:70 parts by weight, in the presence of about 5 to about 500 ppm by weight, of an inorganic compound capable of forming an ion or ion pair in water or the non-solvent and then drying the precipitated polyolefin powder.

4,038,478

O-GLYCOSIDE ORTHO ESTERS OF NEAMINE CONTAINING COMPOUNDS

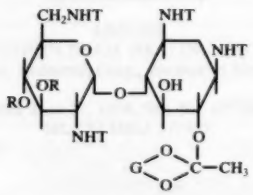
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 611,349, Sept. 8, 1975, Pat. No. 3,996,205. This application June 16, 1976, Ser. No. 696,795

Int. Cl.[2] C07H *15/22*

U.S. Cl. 536—17 **20 Claims**

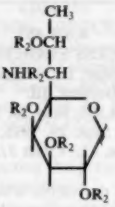
1. A compound of the formula



wherein T is H or an amino blocking group, R is selected from the group consisting of H or a hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive; and G is a glycosyl moiety selected from the group consisting of

wherein R_1 is selected from the group consisting of OH, OAc,

$OCH_2\phi$, NHR′, NR′ alkyl; wherein Ac is acetyl, R′ is H or acyl of from 1 to 8 carbon atoms, inclusive; alkyl is from 1 to 5 carbon atoms, inclusive; and



wherein R_2 is H or acetyl; and nontoxic pharmaceutically acceptable acid addition salts thereof.

4,038,479

AMINO PURINE DERIVATIVES

Gertrude B. Elion, Bronxville, N.Y., and Robert A. Strelitz, Edison, N.J., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 877,443, Nov. 17, 1969, Pat. No. 3,666,856. This application Sept. 7, 1971, Ser. No. 178,406

Int. Cl.[2] C07H *19/16*

U.S. Cl. 536—24 **2 Claims**

1. 2,6-diamino-9-(β-D-arabinofuramosyl)purine.

4,038,480

6-AMINOCARBONYL PURINE 3′,5′-CYCLIC NUCLEOTIDES

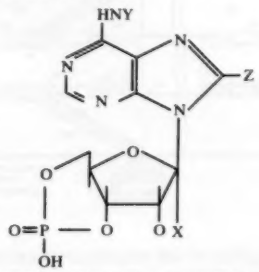
Roland K. Robins, Santa Ana; Dennis A. Shuman, and Kay H. Boswell, both of Mission Viejo, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Sept. 17, 1973, Ser. No. 398,009

Int. Cl.[2] C07H *19/20*

U.S. Cl. 536—27 **22 Claims**

1. A compound of structure



wherein Y is $COOR_1$, $CONHR_1$, or $CONHC_6H_5$, X is C_1–C_{18} acyl, Y or H, Z is H, bromine, chlorine or SR_2, R_1 is C_1–C_6 alkyl and R_2 is H, phenyl, benzyl or C_1–C_6 alkyl.

4,038,481

METHOD FOR TREATMENT OF CORN HULLS

Richard Lee Antrim, Clinton, and Donald Wayne Harris, Camanche, both of Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,232

Int. Cl.[2] C08B *1/00, 37/14*

U.S. Cl. 536—56 **10 Claims**

1. A method for treating corn hulls to obtain a cellulose fraction, a hemicellulose fraction and a noncarbohydrate fraction comprising treating corn hulls with a sufficient amount of alkali to hydrolyze the corn hulls to affect liberation of the hemicellulose fraction so that it may be solubilized in water

and to solubilize the noncarbohydrate fraction, recovering a hemicellulose fraction, an organic solvent extract of the noncarbohydrate fraction and an insoluble residue comprising the cellulose fraction.

4,038,482

RETORT PROCESS STARCH DERIVATIVES

James E. Eastman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Division of Ser. No. 474,300, May 28, 1974, Pat. No. 3,954,514. This application Sept. 29, 1975, Ser. No. 617,770

Int. Cl.[2] C08B *31/04*

U.S. Cl. 536—110 **7 Claims**

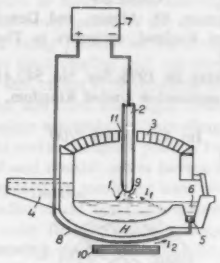
1. A modified starch derivative which exhibits thick viscosity characteristics upon atmospheric heating but which subsequently decreases subtantially in viscosity upon continued heating in a sealed container consisting essentially of a base starch selected from the group consisting of root and root-type starches, said modified starch having 0.05–6% acetyl groups substituted thereon to give a degree of substitution of 0.02 to 0.295 and a 5% dsb sample of said starch being capable of forming a viscous cooked, paste when subjected to heating to 185° F. under atmospheric pressure, said sample having a hot paste viscosity of greater than 2,300 centipoise (20 rpm Brookfield), but further exhibiting substantially complete loss of viscosity to a retorted viscosity of less than 150 centipose (20 rpm Brookfield) after being heated in a sealed container for at least about 20–60 minutes to a temperature of at least about 210°–260° F. in an autoclave, and being allowed to cool overnight at 74°–76° F.

4,038,483

MEANS FOR DIRECT CURRENT ARC FURNACES

Sven Einar Stenkvist, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Jan. 7, 1976, Ser. No. 647,215
Claims priority, application Sweden, Jan. 14, 1975, 75003442
Int. Cl.[2] H05B 7/20
U.S. Cl. 13—11 8 Claims



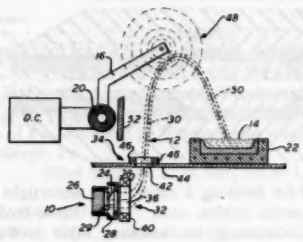
1. A DC electric arc furnace comprising a furnace enclosure having a hearth for containing a melt, said hearth having a contact electrode for the melt, an arcing electrode positioned above the melt for forming an arc with the melt when placed in circuit therewith via said electrode, said arcing and contact electrodes being relatively offset in a horizontal direction so that the arc is normally angularly deflected with respect to a vertical direction, and means for applying a magnetic field to the arc so as to control its arcing direction, said furnace having a DC power source and means for electrically connecting said electrodes in series with said source to form through said melt, an electric power circuit powered by said source, said means being formed by said power circuit including at least one electric conductor positioned to form said magnetic field and which is in series connection with the balance of said power circuit.

4,038,484

ELECTRON BEAM HEATING SYSTEM

Alan C. Shrader, Redmond, Oreg., assignor to Airco, Inc., Montvale, N.J.

Filed June 21, 1976, Ser. No. 697,904
Int. Cl.[2] H01J 37/305
U.S. Cl. 13—31 9 Claims



9. An electron beam apparatus for heating a target, comprising:

an electron gun positioned beyond the line-of-sight from the target;

means for directing the bea from the gun in an initial direction generally toward the target;

magnetic means for deflecting the beam through a path of net positive curvature into a final direction in which the beam is incident on the target, and for deflecting the beam through an intermediate path section of comparative negative curvature.

4,038,485

TEST COMPOSITION, DEVICE, AND METHOD

Katharine Gentry Johnston, and Jerome Greyson, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkart, Ind.

Continuation-in-part of Ser. No. 667,981, March 18, 1976, abandoned. This application Sept. 17, 1976, Ser. No. 724,365
Int. Cl.[2] G01N 31/22, 33/16
U.S. Cl. 23—230 B 38 Claims

26. A method for detecting the presence of a component in a sample, the method comprising;

a. contacting said sample with a carrier matrix incorporated with (i) a reactant system which, upon contact with said sample, interacts with said component to produce a detectable response, and (ii) an inhibitor system which, upon contact with said sample, prevents the reactant system from interacting with the component after a predetermined time,

b. incubating the matrix, after contact with the said sample, for said predetermined time, and

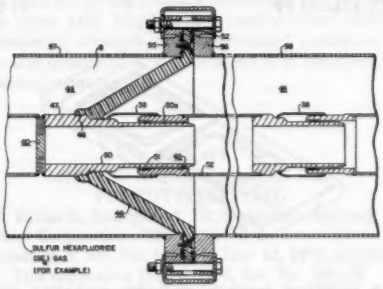
c. observing said detectable response.

4,038,486

SUPPORTING INSULATOR ASSEMBLY FOR GAS-INSULATED EQUIPMENT

Jeffry R. Meyer, Pittsburgh, and John S. Billings, Jr., Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,729
Int. Cl.[2] H01B 9/06
U.S. Cl. 174—28 2 Claims



1. A gas-insulated transmission-line including, in combination:

a. means defining an outer-disposed grounded metallic casing;

b. an interiorly-disposed high-voltage metallic transmission-line conductor located generally along the axis within said outer grounded casing;

c. a supporting insulator assembly for fixedly supporting said inner high-voltage, transmission-line conductor and cast to said inner high-voltage transmission-line conductor; and

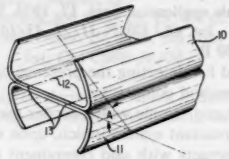
d. the inner high-voltage, transmissiion-line conductor having an annular protruding metallic attachment surface (48) at the casting location and moreover cast therein to reduce high-gradient voltages within the insulating body-portion of said insulator-support assembly and to provide, additionally, secure mechanical bonding of said insulator assembly to said inner high-voltage conductor.

4,038,487

SHIELDED MULTIPAIR CABLE

John Robert Apen, Stone Mountain, and William Homer Bray, Jr., Tucker, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,411
Int. Cl.² H01B 7/18
U.S. Cl. 174—36 **7 Claims**



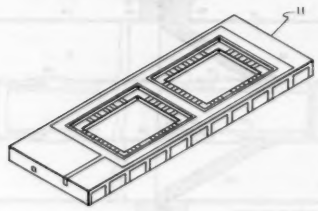
1. A mutipair communications cable comprising:
a core of insulated conductors;
a screen partitioning the core, comprising:
a first and a second metallic sheet, each being C-shaped in cross section and disposed in back-to-back relation; a jacket enveloping said core and screen; and means continuously joining the sheet backs along
two separated paths parallel to the cable axis, creating an unjoined region between said paths.

4,038,488

MULTILAYER CERAMIC MULTI-CHIP, DUAL IN-LINE PACKAGING ASSEMBLY

Paul T. Lin, Wappingers Falls, N.Y., assignor to Cambridge Memories, Inc., Poughkeepsie, N.Y.

Filed May 12, 1975, Ser. No. 576,298
Int. Cl.² H05K 5/00
U.S. Cl. 174—52 FP **11 Claims**



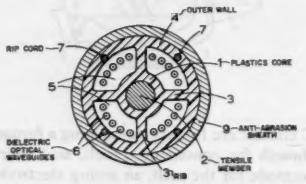
1. A multilayer ceramic, multi-chip packaging assembly comprising:
a ceramic substrate having at least a pair of semiconductor chip receiving cavities therein;
a metalization pattern partially embedded within said substrate for providing electrical paths for semiconductor chip devices joined thereto to external circuitry;
said pattern including a first level having at least a pair of exposed pads for joining semiconductor chips thereto;
at least a pair of semiconductor chip devices joined to said joining pads within said semiconductor chip receiving cavities;
said pattern further including a second level above said first level, said second level including
exposed finger areas spaced from one another and about said semiconductor chip receiving cavities, and
leads extending between said finger areas and semiconductor chip terminals of said semiconductor chip devices within said semiconductor chip receiving cavities;
said finger areas on one side of one of said chip receiving cavities being offset with respect to said finger areas on the opposite side of said one of said chip receiving cavities; and,
said offset finger areas on one side of said one of said chip receiving cavities being aligned with finger areas on one side of another of said chip receiving cavities.

4,038,489

CABLES

Derek William Stenson, St. Albans, and Dennis Ray Bissel, Chesham, both of England, assignors to The Post Office, London, England

Filed May 29, 1975, Ser. No. 582,415
Claims priority, application United Kingdom, May 31, 1974, 24321/74
Int. Cl.² H01B 7/00
U.S. Cl. 174—70 R **6 Claims**



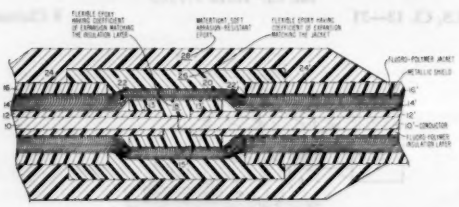
1. A telecommunications cable comprising an outer wall separated from a central core by a plurality of rib elements; said outer wall, plurality of rib elements, and central core defining a plurality of compartments, each of said compartments partially filled with two or more coated dielectrical optical waveguides, said central core including a tensile member.

4,038,490

WATER-SEAL SPLICE FOR COAXIAL CABLES AND METHOD OF MAKING SAME

Gerald K. Miller, Saratoga, and Sam Lum, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1975, Ser. No. 582,561
Int. Cl.² H02G 15/08, 1/14
U.S. Cl. 174—88 C **7 Claims**



1. A method for forming a three level watertight splice between two coaxial cables, each coaxial cable having an exposed center conductor, an insulating layer around this center conductor, a metallic shield layer encompassing this layer, and an outer jacket, said method comprising the steps of:
joining the exposed center conductors of the cables to be spliced;
applying a first potting compound over the exposed sections of the center conductors to form a first watertight cylinder around the center conductors which overlaps the insulating layers of the cables, said potting compound being chosen to be flexible after curing and to have a temperature coefficient substantially matching the temperature coefficient of said insulating layer;
joining the metallic shield layers of said cables;

applying a second potting compound over the exposed section of the metallic shielding layer to form a second watertight cylinder which overlaps the outer jackets of cables, said second potting compound being flexible after curing and having a temperature coefficient substantially matching the temperature coefficient of said outer jacket; and

applying a third potting compound over said second watertight cylinder to form a third watertight cylinder which overlaps the outer jackets of the cables, said third potting compound being chosen for its abrasion resistance and softness to limit chafing and cut-through of said outer jackets of said cables at the point of emergence of of said cables from said third watertight cylinder.

4. A cable-splice assembly for providing an effective three level watertight seal at the splice point of two coaxial, abutting cables, each of said coaxial cables having a center conductor with its end exposed, an insulating layer over this center conductor, a metallic shield layer encompassing the insulating layer, and an outer flexible jacket, said coaxial cables being joined at the abutting, exposed ends of their center conductors, said splice-assembly comprising:

first potting means formed approximately in the shape of a cylinder, covering the exposed section of the center conductors and overlapping the insulating layers of said coaxial cables to form a watertight seal, said first potting means being flexible after curing and having a thermal-expansion coefficient substantially matching the thermalexpansion coefficient of said insulating layer;

means electrically joining the shielding layers of said coaxial cables;

second potting means, formed approximately in the shape of a cylinder, covering said joining means of the shielding layers and overlapping the outer flexible jackets of said coaxial cables to form a second watertight seal, said second potting means being composed of material which is flexible after curing and has a thermalexpansion coefficient substantially matching the thermal-expansion coefficient of said outer flexible jacket; and

third potting means, formed approximately in the shape of a cylinder, completely covering said second potting means and overlapping the outer jackets of said coaxial cables to form a third watertight seal, said third potting means being composed of material with a soft abrasion resistant physical characteristic to limit chafing and cut-through of said outer jackets of said cables at the point of emergence of said cables from said third watertight seal.

4,038,491

FLUID CASTING COMPOSITION CONTAINING LOW EXPANSION GLASS FILLER

James R. Gamble, Unity Township, Westmoreland County, and James W. Chapman, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1976, Ser. No. 671,853
Int. Cl.[2] H01B *17/26*; C08L *63/00*
U.S. Cl. 174—153 R **10 Claims**

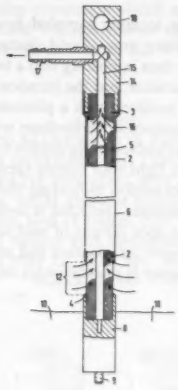
1. A fluid, filled, resinous casting composition, suitable for use with electrical assembly elements, comprising: (A) 100 parts by weight of a liquid resin, (B) about 250 parts by weight to about 750 parts by weight of a powdered glassy filler comprising: about 50 weight percent to about 60 weight percent of SiO_2, about 12 weight percent to about 22 weight percent of Al_2O_3, about 5 weight percent to about 15 weight percent of B_2O_3, about 4 weight percent to about 14 weight percent of MgO and about 2.5 weight percent to about 12.5 weight percent of CaO and (C) about 20 parts by weight to about 100 parts by weight of a resin curing agent, said fluid casting composition being characterized by a viscosity of between about 1,500 cp. and 20,000 cp. at 100° C.

4,038,492

CURRENT FEEDING DEVICE FOR ELECTRICAL APPARATUS WITH CONDUCTORS COOLED TO A LOW TEMPERATURE

Dieter Kullmann, Langenzenn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1976, Ser. No. 661,424
Claims priority, application Germany, Apr. 9, 1975, 2515477
Int. Cl.[2] H01B *12/00*
U.S. Cl. 174—15 S **10 Claims**



1. In a current feeding device for electrical apparatus having conductors cooled to a low temperature, which conductors have their end connected to a normal conductor which is cooled by a cold gas and consists of metal netting, the improvement comprising:

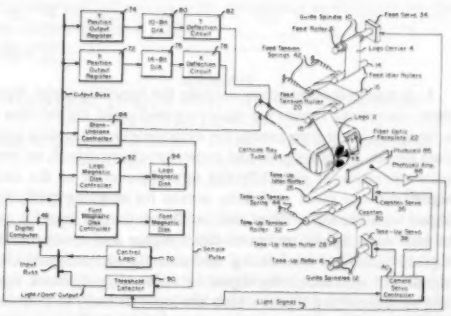
The metal net having constant conductor cross section over its entire axial length; and a predetermined number of conductor elements of predetermined conductor cross section connected to said metal net in an electrically conducting manner.

4,038,493

METHOD AND APPARATUS FOR PHOTOTYPESETTING

John S. Richards, Bolingbrook, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 586,830, June 13, 1975, abandoned.
This application Dec. 6, 1976, Ser. No. 748,128
Int. Cl.[2] H04L *15/00*
U.S. Cl. 178—15 **30 Claims**



1. A method of recording and phototypesetting a character having light and non-light transmitting areas in phototypeset-

ting apparatus including light spot scanning means comprising the steps of:

disposing said character on a logo medium;

translating said logo medium with respect to a common scanning/photosetting station disposed in a fixed relation with respect to said scanning means, whereby the character is disposed in a position to be scanned thereby;

scanning a light spot with respect to the character with said scanning means and regularly turning on and off the light spot to sample said character at corresponding, predetermined locations;

sensing whether the location sampled is within a light or non-light transmitting area of said character;

recording character data indicating that a transition has been sensed in said character and the location thereof;

replacing said logo medium with a photosensitive medium;

transporting said photosensitive medium with respect to the common scanning/photosetting station to be in position to be exposed by the light spot output thereof;

providing input information indicating that the phototypesetting of said character recorded is desired; and

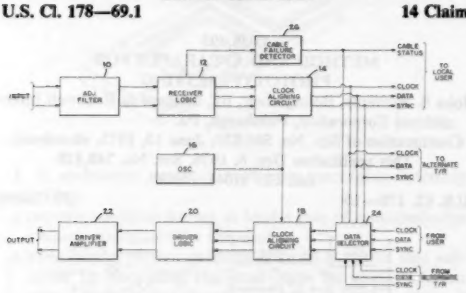
controlling the light spot output of said scanning means in response to said input information and said character data so that said character is phototypeset on said photosensitive medium.

4,038,494

DIGITAL SERIAL TRANSMITTER/RECEIVER MODULE

George W. Miller, Anoka; Mark D. Ryan, Fridley, and Bill H. Niemi, Brooklyn Park, all of Minn., assignors to FMC Corporation, San Jose, Calif.

Filed June 17, 1975, Ser. No. 587,777
Int. Cl.[2] H04B *1/16*
U.S. Cl. 178—69.1 14 Claims



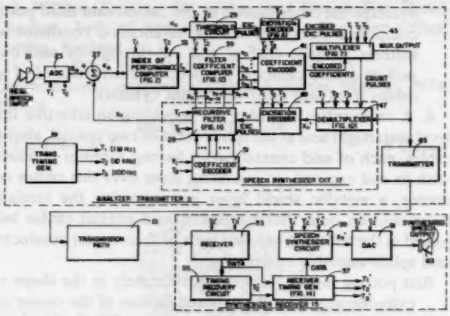
1. A transmitter/receiver module for handling serial digital data comprising means for receiving said serial digital data on a two-wire input line; means for demodulating said data into a data signal, a clock signal and a synchronizing signal; an oscillator operative at generally the same frequency as the clock signal derived from said data; means for aligning said clock signal with the signal from said oscillator; output lines for each of said data signal, realigned clock signal and synchronizing signal; means for modulating said data signal, realigned clock signal and synchronizing signal or a data signal, clock signal and synchronizing signal which are input directly to said module, said modulation providing a single serial digital data signal; and means for transmitting said modulated signal over a two-wire output line.

4,038,495

SPEECH ANALYZER/SYNTHESIZER USING RECURSIVE FILTERS

Stanley A. White, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1975, Ser. No. 632,119
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SA 14 Claims



1. A system comprising:

input means responsive to an input speech signal and to a feedback digital speech signal for developing an error signal;

first means for extracting excitation signals from the error signal;

second means for developing a performance measure signal as a function of the error signal;

a first recursive filter responsive to feedforward and feedback filter coefficient value signals and to the excitation signals for developing filter state signals and the feedback digital speech signal to minimize the error signal; and

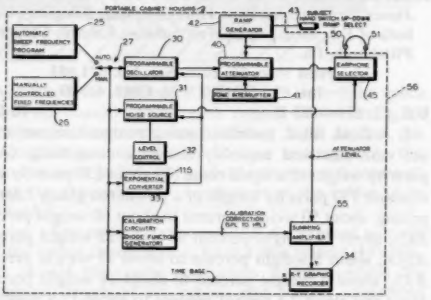
third means responsive to the performance measure signal and the filter state signals for developing the feedforward and feedback filter coefficient value signals, the feedforward and feedback filter coefficient value signals causing said first recursive filter to converge to minimize the error signal.

4,038,496

PORTABLE BEKESY TYPE DIAGNOSTIC AUDIOMETER

Michael D. Feezor, Chapel Hill, N.C., assignor to Audiometric Teleprocessing, Inc., Chapel Hill, N.C.

Filed May 15, 1975, Ser. No. 577,626
Int. Cl.[2] H04R *29/00*
U.S. Cl. 179—1 N 16 Claims



1. A diagnostic audiometer for producing an audiogram indicative of a patient's hearing threshold comprising, in combination:

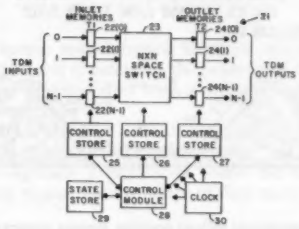
a. a set of right and left earphones;
b. a two position patient actuated switch;
c. programmably controllable oscillator means adapted to provide in response to application of a selected series of voltage levels in predetermined order thereto a corresponding series of continuous tone signals in corresponding order, such tone signal being of a selected audio frequency, amplitude and period of duration;
d. a programmably controllable continuous ramp voltage source productive of a ramp voltage wave controllable as to ascending and descending direction and representing a control voltage having maximum and minimum values when moved without interruption in either direction, said ramp voltage source being connected to said two position switch and being adapted such that the direction of said ramp voltage wave may be interrupted and reversed in direction by the position of said two position switch and the magnitude of the ramp voltage wave may be regulated in coordination with desired maximum and minimum audio thresholds in said earphones;
e. programmably controllable circuit attenuator means connected to said oscillator means to receive said tone signals and to said ramp voltages source to receive said ramp voltage wave, said attenuator means being adapted to produce therefrom a series of audio output test signals having precisely controlled gain qualtities in linear proportion to said control voltage and at the selected said frequency;
f. programmed logic controlled voltage source means connected to said oscillator means and having an output for being connected to an X–Y graphic recorder means, and being adapted to automatically provide a series of control voltages to programmably control said oscillator means in a sweep frequency mode of operation whereby upon actuation thereof said oscillator means is caused to produce said tone signals in correspondence with said control voltages and in a sweep frequency mode;
g. a programmably controllable noise signal source connected to said logic controlled voltage source and adapted when appropriately connected to said earphones and when one ear is being tested with a particular test signal in the series to provide for the opposite ear a masking noise appropriately selected and programmed to mask said particular test signal;
h. a manually controllable right-left earphone switch connected to both said attenuator source of audio test signals and said noise signal source of masking noise and adapted in one position to receive and direct the particular audio test signal being employed to the right ear and the corresponding masking noise being employed to the left ear and in another position to receive and direct the particular audio test signal to the left ear and the corresponding masking noise to the right ear wherein said patient hears as he manually alternates the positions of said earphone switch first in one said earphone and then in the other a programmed series of said continuous test signals in a predetermined order and repeatable sequence and as such sequence test signals proceed a corresponding sequence of said masking noises are directed to the ear not being tested and such that during the hearing of each such test signal in each respective earphone the patient is enabled to move said two position switch to a first position when said test signal is first heard and to a second position when said test signal is lost to hearing and by so positioning said two position switch said patient being able to control both the direction of said ramp voltage wave and the maximum or minimum level achieved in each direction;
i. X–Y graphic recording means connected to said programmed logic controlled voltage source output and to said ramp voltage source and adapted to develop and record a printout for said patient in a form directly corresponding to the earphone levels heard as determined by, when and at what amplification levels the patient operates said two position switch in respect to said test signals as an indication of the patient's hearing loss.
j. voltage responsive compensation circuit means including a diode function generator connected and adapted to provide a calibration correction voltage representing the conversion of sound pressure level to hearing threshold level and providing a compensation voltage therefor and further representing a correction for earphone frequency response deficiencies and providing an earphone deficiency correction voltage therefor; and
k. summing amplifying circuit means connected to combine said calibration correction signal and the output of said logic controlled voltage source means and produce an output therefrom to control the Y-axis of said recording means.

4,038,497

HARDWIRED MARKER FOR TIME FOLDED TST SWITCH WITH DISTRIBUTED CONTROL LOGIC AND AUTOMATIC PATH FINDING, SET UP AND RELEASE

Arthur A. Collins, 13731 Danvers Drive; John C. Bellamy, II, 7605 Chattington, both of Dallas, Tex. 75240, and Richard L. Christensen, 22 Bunker Hill, Richardson, Tex. 75080

Filed May 12, 1975, Ser. No. 576,451
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 AT **23 Claims**



1. In a time folded time space time switch for interconnecting digital time division multiplex communication lines: hardwired marker circuit means that includes, switch time stage busy/idle status sensing means interconnecting time stage means of said time space time switch with said marker circuit, switch space stage busy/idle status sensing means interconnecting space stage means of said time space time switch with said marker circuit, clock means connected to supply timing signals to said marker circuit means, path search logic means in an automatic path finding, set up and release circuit means in said switch setting up and releasing transmission paths through the switch, with said path search logic means locating an idle path and path disconnect selection logic means connected to said automatic path finding, set up and release circuit for achieving desired circuit path disconnect as initiated by the time stage disconnect signals.

4,038,498

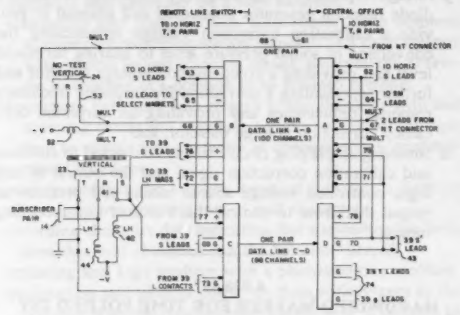
CENTRAL OFFICE SWITCHING SYSTEM WITH REMOTE LINE SWITCH

Frank S. Boxall, 380 Eleanor Drive, Woodside, Calif. 94062

Filed Apr. 12, 1976, Ser. No. 676,542
Int. Cl.² H04Q 3/60
U.S. Cl. 179—18 FC **8 Claims**

1. A telephone subscriber system including remotely located switch units which provide full-access switching of individual ones of a number of remotely located subscriber lines to a lesser number of line-links, transmission paths providing extended line-links between said remote switch units and a serving central office, switch units at said central office providing switching of line-links to junctors, and a two-way multichannel data transmission means connected between said remote

switch units and said serving central office to transmit status and control signals between the remote switch units and the



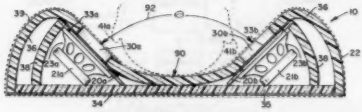
serving central office whereby said serving central office controls switching of remote subscribers lines.

4,038,499

STEREOPHONIC PILLOW SPEAKER SYSTEM

Ronald Norman Yeaple, Fairport, N.Y., assignor to Yeaple Corporation, Rochester, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,576
Int. Cl.[2] H04M *1/04*; H04R *5/02*
U.S. Cl. 179—146 H **18 Claims**



1. A stereophonic pillow speaker system comprising:

a. a first baffle frame;

b. at least one loudspeaker mounted on said baffle frame in cooperative relationship with said baffle frame to derive a first near field effect proximal to said one loudspeaker in response to an electrical signal applied to said one loudspeaker from one channel of an amplifier;

c. a second baffle frame;

d. at least one other loudspeaker mounted on said second baffle frame in cooperative relationship with said second baffle frame to derive a second near field effect proximal to said one other loudspeaker in response to another electrical signal applied to said one other loudspeaker from another channel of said amplifier;

e. pillow means for resiliently isolating said first and second baffle frames in spaced relationship and for positioning said baffle frames at an angle relative to each other so that one ear of a listener is in registry with said first near field effect and the other ear of said listener is in registry with said second near field effect when said listener's head is disposed between said first and second baffle frames; and

f. said pillow means includes resilient means for isolating mechanical vibrations from said first and second baffle frames to said listener's head.

4,038,500

MICROPHONE COUPLER

George J. Frye, 12175 SW. Douglas, Portland, Oreg. 97225

Filed June 20, 1975, Ser. No. 588,885
Int. Cl.[2] H04R *29/00*
U.S. Cl. 179—175.1 A **3 Claims**

1. An earphone testing system comprising:

a rigid supporting member,

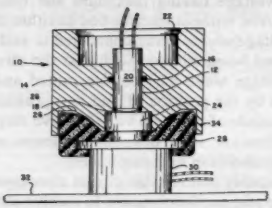
an earphone to be tested positioned on said supporting member with its acoustic output end facing upwardly,

a raltively heavy body member provided with a bore therethrough terminating in a cavity of predetermined volume at one end and forming an acoustic coupler,

a microphone fitted closely within the bore,

said coupler having an annular lip extending axially from said one end,

a cushioning member within the space provided by said lip having an opening therethrough in communciation with said cavity therein and seated against said one end,



said body member being seated on said one end of the earphone through the interposition of said cushioning member, the acoustic output of the earphone being in direct communication with the cavity in the body member through the opening in the cushion member,

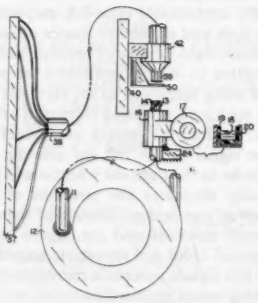
the body member being of sufficient weight to compress the cushioning member against the earphone to provide the necessary coupling pressure to prevent acoustic leakage between the earphone output and the microphone.

4,038,501

APPARATUS AND METHOD FOR AUTOMATICALLY CONNECTING TO THE INDIVIDUAL CONDUCTORS OF A MULTICONDUCTOR CABLE

Victor F. Volk, 646 Snug Harbor Drive, Boynton Beach, Fla. 33435

Filed July 10, 1975, Ser. No. 594,691
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **13 Claims**



1. Apparatus for making connection to the individual insulated conductors of a multiconductor cable without separating said individual conductors from one another comprising:

A. clamping means for holding an end section of a bundle comprising a large plurality of said insulated conductors in a fixed position relative to elements of said apparatus,

B. a grid comprising a plurality of conductors substantially exceeding in number said plurality of insulated conductors of said bundle, said conductors of said grid being separated from one another, and a substantially planar end section at least equal in size to said section of said bundle, said end section defining a coordinate system,

C. automatic means for determining the coordinates in said system of the end section of each said conductors in said bundle,

D. computer means for storing said coordinates,

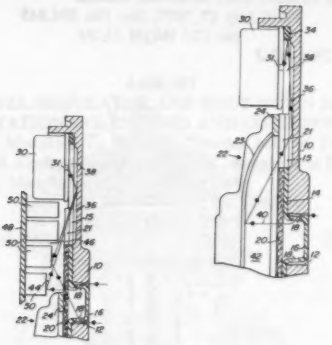
E. means controlled by said computer means for selectively removing individual conductors of said grid from said end section of said grid,

F. means for bringing together said end section of said bundle and said planar section of said grid thereby electrically connecting each of the conductors of said bundle with one conductor of said grid.

4,038,502
ACOUSTIC COUPLING STRUCTURE FOR MICROPHONE

Pasquale Ambruoso, Sr., Coral Springs, and Laszlo Szalvay, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 19, 1975, Ser. No. 560,008
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—179 **10 Claims**



1. In an electronic device having a housing with a sound transmission portion and electronic components within said housing, the combination including:

a microphone within the housing and supported thereby, said microphone having an electro-acoustic element and a sound receiving opening,

a sound reinforcing chamber adjacent said microphone and in communication with said sound receiving opening,

a cavity within the housing for receiving sound through the sound transmission portion, and

means forming an indirect passage connecting the cavity within the housing to said sound chamber to apply sound received from outside the housing through the indirect passage to said microphone, said passage forming means comprising a portion of the surface of at least one of said electronic components.

10. In an electronic device having a housing with a sound transmission portion, the combination including:

a loudspeaker having a cone;

a microphone within the housing and supported thereby, said microphone having a sound receiving opening,

a sound reinforcing chamber adjacent said microphone and in communication with said sound receiving opening,

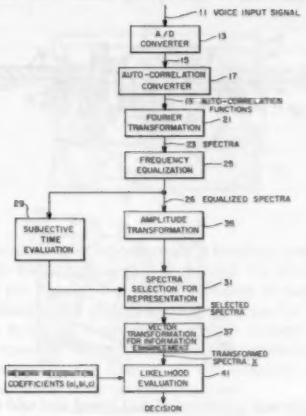
a cavity within the housing for receiving sound through the sound transmission portion, and

means forming an indirect passage connecting the cavity within the housing to said sound chamber to apply sound received from outside the housing through the passage to said microphone, said passage forming means including a portion of said loudspeaker cone.

4,038,503
SPEECH RECOGNITION APPARATUS

Stephen L. Moshier, Cambridge, Mass., assignor to Dialog Systems, Inc., Cambridge, Mass.

Filed Dec. 29, 1975, Ser. No. 644,722
Int. Cl.[2] G10L 1/00
U.S. Cl. 179—1 SA **10 Claims**



1. In a speech analysis system in which an audio signal is spectrum anal/zed to determine the behavior of formant resonances over an interval of time, a frequency compensation method comprising:

repeatedly within said interval, evaluating a set of parameters determining the short-term power spectrum of said audio signal in a subinterval within the said interval, thereby to generate a sequence of short-term power spectra;

for each parameter in the set, determining the maximum value of the parameter occurring over the interval, the set of maximum values thereby determined corresponding to a peak spectrum over the interval;

smoothing the peak spectrum by averaging each maximum value with values from said set of maximum values corresponding to adjacent frequencies, the width of the band of frequencies contributing to each averaged value being approximately equal to the typical frequency separation between formant frequencies; and

for each short-term power spectrum in said sequence of spectra, dividing the value for each parameter in the set by the corresponding smoothed maximum value in the smoothed peak spectrum, thereby to generate over said interval a sequence of frequency band equalized spectra corresponding to a compensated audio signal having the same maximum short-term energy content in each of the frequency bands comprising the spectrum.

4,038,504
ROTARY, PRINTED CIRCUIT WAFER SWITCH AND METHOD FOR ADJUSTING

James C. McAnulty, Dunedin, and Edwin B. McCarthy, Clearwater, both of Fla., assignors to A.C. Nielsen Company, Northbrook, Ill.

Filed Nov. 19, 1975, Ser. No. 633,503
Int. Cl.[2] H01H 9/00, 19/58
U.S. Cl. 200—11 DA **16 Claims**

1. In combination, a printed circuit board having an aperture and first and second sides, contact array means defined on at least one of said first and second sides, and

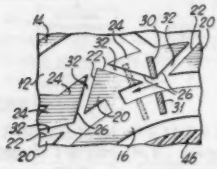
a switch comprising

a substantially planar rotor fabricated of nonconductive

material having a central aperture and first and second planar surfaces,

at least one switch blade mounted upon said first planar surface, and

a bushing fabricated of nonconductive material having resilient spring means of a larger cross-sectional area than the cross-sectional area of said aperture in said rotor, whereby upon insertion of said spring means from said first side



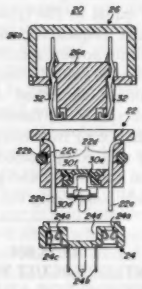
through said apertures of said board and said rotor and to said second side of said board, respectively, such that said blade abuts said board on said second side, said spring means is deformed such that the frictional force resulting from said fit in said aperture in said rotor is greater than the drag force resulting from movement of said blade along said second side upon rotation of said bushing so that said bushing and said rotor act in concert as one element and on opposite sides of said board.

4,038,505

SUBMINIATURE CONNECTOR ARRANGEMENT

Bernard Gasparaitis, Fort Lauderdale; Jay H. Eichler, Boca Raton, and Alfred Y. Terao, Margate, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1975, Ser. No. 554,829
Int. Cl.[2] H01R 13/70
U.S. Cl. 200—51.1 **8 Claims**



1. An improved subminiature electrical connector arrangement for use with associated electrical apparatus with internally positioned components, said connector arrangement including in combination:

a housing having an opening and a recess spaced therefrom;

a female connector assembly having a first portion thereof for positioning internally of said housing and adapted for interconnection to components of the apparatus, and a second connector portion for making a snap-in, watertight fit within said opening in said housing and mechanically and electrically engaging said first connector portion;

a male connector plug for detachably interfitting with said second connector portion of said female assembly; and

means for securing said male portion in the interfitted relation within said female portion,

said male connector including means for automatic alignment of said plug when interfitting with said female connector portion, said means including a projection extending therefrom for effecting a camming action with respect to said housing recess together with contact elements being positioned about the periphery of said male connector plug and having forward tapered portions,

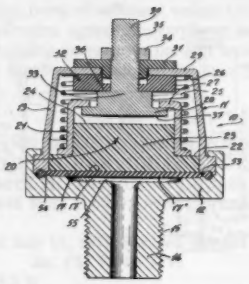
said male connector further including means for automatic disengagement with and at least partial ejection from said female connector portion upon release of said securing means.

4,038,506

OIL PRESSURE SWITCH HAVING IMPROVED DIAPHRAGM SEAL

Stanislaw F. Filip, Don Mills, Canada, assignor to I.C.S. Ignition Control Systems Ltd., Montreal, Canada

Filed July 17, 1975, Ser. No. 596,845
Int. Cl.[2] H01H 35/34
U.S. Cl. 200—83 J **3 Claims**



1. An oil pressure switch comprising a housing having an inlet end connectable to an oil pressure line to admit oil from said line within said housing, a flexible membrane secured in said housing and having opposed surfaces, one of said surfaces being in contact with oil admitted to said housing, the other of said surfaces being in engagement with a displaceable member supporting a spring biased electrical contact, said spring biased contact being in abutting engagement with a stationary electrical contact, external connection means for said stationary electrical contact, said membrane being displaced by oil pressure in an oil pressure line connected to said inlet end whereby said spring biased contact is caused to be displaced against its spring biased direction to cause disengagement with said stationary electrical contact, said flexible membrane being a flat member of flexible impervious material having a peripheral ridge of larger thickness than the major portion of said flat member, said ridge being clamped in a continuous cavity which is of larger cross-sectional area than the cross-section of said ridge, said ridge being oval in cross-section with the long central axis of said oval extending transversely of the planar axis of said flat member, said continuous cavity being defined between opposed surfaces of two displaceable wall sections of said housing, said cavity having a substantially circular cross-section clamping portion with a narrow throat opening on an inner side thereof, said narrow throat opening being of smaller width than the thickness of said major portion of said flat member whereby said flat member adjacent said ridge will be maintained in compression along said narrow throat opening, said oval ridge being compressed in said continuous cavity

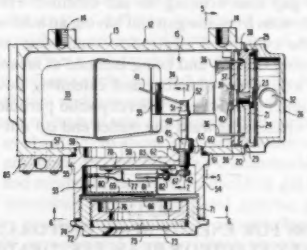
from opposed sides in the direction of said long central axis, said housing being constituted by a base section and a cap section, said inlet end being provided in said base section, said continuous cavity being defined between opposed surfaces of said base and cap sections, said continuous cavity being located in an area of said housing about said inlet end to seal said inlet end from the inner area of said cap section which constitutes a switching chamber, both said electrical contacts being located at least partly in said chamber, a contact support block of non-conductive material being in engagement with said other of said surfaces of said membrane, said support block having an outer stop face, said stationary contact having a flanged end with a flat contact surface spaced from said outer stop face, said spring biased electrical contact being urged in guided engagement with said support block and having a flange wall in abutting engagement with said flanged end to limit said displacement of said spring biased electrical contact, said displacement of said membrane being limited by abutment of said outer stop face with said flat contact surface.

4,038,507

OIL LEVEL REGULATOR AND SHUT-DOWN DEVICE FOR STATIONARY ENGINES AND COMPRESSORS

Frank W. Murphy, Jr.; Buddy G. Sparks, both of Tulsa, and Lewis M. Carlton, Jenks, all of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed Feb. 20, 1976, Ser. No. 659,846
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 R **12 Claims**



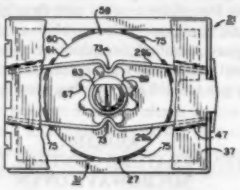
1. An oil level regulating and safety shut-down device for engines and the like comprising a housing means having a float chamber provided with oil inlet and oil outlet passage means and an explosion-proof chamber isolated from the float chamber, float valve means on the housing means in the float chamber for automatically opening and closing said oil inlet passage means to maintain an optimum level of oil in the float chamber, a sealed rotary shaft extending between the float chamber and explosion-proof chamber and operatively engaged with the float valve means whereby rising and falling of the latter causes turning of said rotary shaft, an indicator means on said rotary shaft in the explosion-proof chamber, and an engine shut-down control means in the explosion-proof chamber including a movable actuator in the path of movement of said indicator means, said float valve means comprising a float and float supporting arm pivotally mounted in said float chamber, a valve element bodily carried by said float supporting arm and swingable therwith into opening and closing engagement with said oil inlet passage means, and a crank arm on said sealed rotary shaft in the float chamber and having a lost motion connection with said float supporting arm.

4,038,508

ELECTRICAL SWITCH METHOD OPERATING SUCH AND INDEXING SYSTEM

George C. Mapelsden, Easton, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 22, 1975, Ser. No. 579,949
Int. Cl.[2] H01H *3/50, 19/00;* **G05G** *5/00*
U.S. Cl. 200—329 **38 Claims**



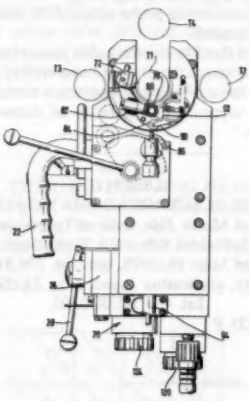
1. An electrical switch comprising a housing, means operable generally for switching power through the switch, means rotatable in the housing between a plurality of indexed positions for actuating the switching means, means for releasably holding the actuating means in each of its indexed positions, and means operable independently of said releasably holding means for retarding the rotation of the actuating means between at least some of its indexed positions.

4,038,509

ORBITAL WELDING APPARATUS

Leslie Henderson, Whitley Bay, England, and Thomas Bentham Hemsley, deceased, late of Monkseaton, England (by Vera Hemsley, executrix), assignors to Clarke Chapman Limited, Gateshead, England

Filed Oct. 2, 1975, Ser. No. 618,979
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—60 A **4 Claims**



1. Orbital welding apparatus comprising a main assembly including a support structure carrying first and second rotary drive means and having a generally U-shaped portion comprising two fixed parallel limbs between which a tube to be welded can be received; said support structure also having mounted thereon two clamp jaws and means for operating said jaws, said clamp jaws being relatively movable by said jaw operating means to first relative positions in which a tube to be welded and said support structure can be relatively positioned by relative movement transversely to the length of the tube, said tube entering between said parallel limbs, said clamp jaws being movable by said jaw operating means to second relative positions to grip said tube in position for welding between said

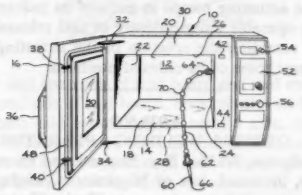
parallel limbs; a rotatable assembly carried by said support structure and comprising first and second relatively rotatable gear members rotatable about a common axis, said gear members each being generally of U-shape, said gear members being rotatable into like positions with said U-shape of said support structure in which to receive said tube therein, said first and second gear members being rotationally coupled to said first and second drive means, respectively, said rotatable assembly also comprising arc welding means including wire feed mechanism mounted for rotation with said first gear member, said feed mechanism being operable by relative rotation of said first and second gear members; conductive means for supplying welding current to said arc welding means; and gas duct means for supplying gas to said arc welding means.

4,038,510

FOOD TEMPERATURE CONTROL CABLE FOR MICROWAVE OVEN

James A. White, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 3, 1976, Ser. No. 663,236
Int. Cl.[2] H05B 9/06; G01K 1/08
U.S. Cl. 219—10.55 E **7 Claims**



1. Apparatus for monitoring the internal temperature of food being heated in the cooking cavity of a microwave oven, said cooking cavity being formed by a box-like oven liner and an access door, said apparatus comprising:

a. a temperature-sensing probe adapted for insertion into the food to be heated;

b. an elongated flexible electric cable joined to the probe and adapted to connect the probe to one wall of the oven liner for joining the cable in a temperature control circuit;

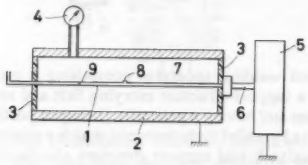
c. said cable supporting a plurality of diameter-increasing protrusions.

4,038,511

METHOD FOR ELECTROPNEUMATIC CONVERSION

Joji Yamaga, and Morio Jido, both of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 19, 1975, Ser. No. 559,814
Claims priority, application Japan, May 21, 1974, 49-56956
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 P **4 Claims**



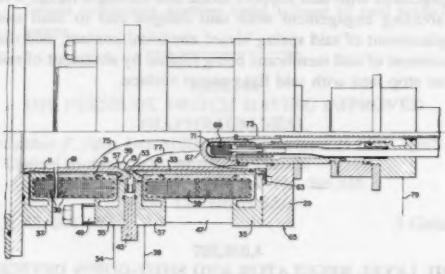
1. An apparatus for electropneumatic conversion which comprises in combination, a discharge electrode supported by an electric insulating material, an opposite electrode disposed to confront said discharge electrode, said electric insulating material and opposite electrodes forming a discharge chamber, a gas disposed in said chamber, means for applying a high electric potential between said discharge electrode and said opposite electrode, pin hole means disposed for communicating said gas in the discharge chamber and the ambient air.

4,038,512

SELF-STABILIZING ARC HEATER

Charles B. Wolf, Irwin; Maurice G. Fey, Plum Borough, and Frederick A. Azinger, Jr., Churchill Borough, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1975, Ser. No. 603,575
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 P **7 Claims**



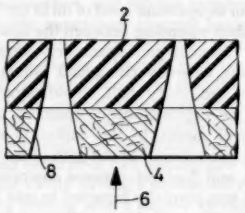
1. An arc heater for processing particulate material comprising at least two axially spaced, substantially cylindrical electrodes forming a narrow gap therebetween and adapted to be connected to a source of potential to produce an arc in the gap, means spacing and electrically insulating the electrodes from each other and comprising means for channeling gas to be heated at a high velocity to the gap, the cylindrical electrodes forming the gap also defining an arc chamber extending in opposite directions from the gap and having an inlet end and an outlet end, the cylindrical electrodes comprising spaced wall surfaces forming the gap and being inclined at an angle to the longitudinal axis of the chamber and extending downwardly toward the outlet end thereof, whereby solid particles moving through the chamber toward the outlet end do not collect in the gap.

4,038,513

PROCESS FOR ENERGY BEAM PERFORATION, ESPECIALLY ELECTRON BEAM PERFORATION, OF MULTI-LAYERED ARTIFICIAL LEATHER

Karl Heinz Steigerwald, Starnberg, Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Germany

Filed Oct. 1, 1975, Ser. No. 618,520
Claims priority, application Germany, Oct. 16, 1974, 2449264
Int. Cl.[2] B23K 15/00
U.S. Cl. 214—121 EM **13 Claims**



1. A process for perforating a multilayered artificial leather product by the energy beam emitted from a beam source, said leather product having a top layer formed of an essentially

impervious material joined to a pervious support layer, said process comprising the steps of:

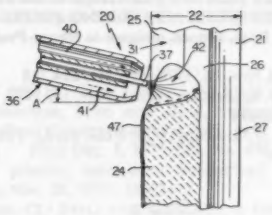
orienting the leather product so that the support layer is toward the beam source; and

applying the energy beam to the support layer to completely perforate the support layer and to perforate the impervious layer.

4,038,514
VERTICAL WELDING OF THICK ALUMINUM MEMBERS

Richard F. Ashton, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Feb. 3, 1975, Ser. No. 546,217
Int. Cl.² B23K *9/12*
U.S. Cl. 219—126 **1 Claim**



1. A method of welding a substantially vertically oriented pair of aluminum members, each of said members having a thickness of at least about 0.5 inches, and each of said members having a land defining surface and a groove defining surface, the land defining surface of one said member being positioned against the land defining surface of the other said member, whereby the groove defining surface of one said member cooperates with the groove defining surface of the other said member to define a substantially vertically oriented groove, the groove defining surface of each said member being characterized such that said groove has a depth of about $\frac{1}{8}$ to about $\frac{1}{2}$ the thickness of each of said members and an included angle in the range of about 45° to about 75°, which method comprises: placing a gas-metal arc torch having a consumable aluminum electrode and means for supplying a shielding gas therearound with said consumable electrode in said groove, generating a welding arc characterized by a weld current ranging between 200 and 400 amperes and an arc voltage ranging between 20 and 40 volts, and moving said torch substantially vertically along said groove while holding said torch at a backhand torch angle ranging between 1° and 25° and feeding said consumable electrode and said shielding gas at rates effective to produce weld metal in said groove having an outside oxide support skin which acts as a sole support for said weld metal during its solidification, said torch being moved at a rate which ranges between 3 and 10 inches per minute and is effective to substantially fill and groove with said weld metal in a single pass.

4,038,515
ASYMMETRICAL A.C. WELDER

Robet L. Risberg, Brookfield, Wis., assignor to Miller Electric Manufacturing Company, Appleton, Wis.

Filed May 8, 1975, Ser. No. 575,685
Int. Cl.² B23K *9/10*
U.S. Cl. 219—131 R **2 Claims**

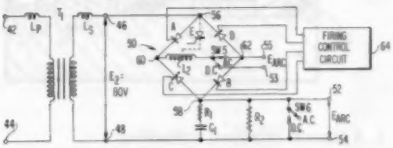
1. A controllable power supply for supplying substantially sqaure waves of current to a welding arc, and comprising:

a single phase, A.C. power source;

a circuit connected in series between said source and said arc, and including first and second controllable, alternately conducting, current paths for supplying current in respectively opposite and mutually exclusive polarities to said arc;

inductor means connected in said current paths, such that the arc current supplied from said source flows in the same direction in seies through said inductor means irrespective of the polarity of the arc current;

control means for rendering said first current path conducting at a selected non-zero value of a positive polarity half-cycle of the source voltage while said arc current is of negative polarity and is being supplied through the conducting second current path by inductive current from said inductor, whereby a free-wheeling path is formed through said current for said inductive current and whereby the positive source voltage causes said arc current to reverse to a positive polarity, said second current path being rendered non-conducting when the positive arc current exceeds the free-wheeling inductive current;



said inductor self-inducing a positive polarity voltage to maintain the positive arc current when the source voltage falls below the arc voltage and reverses polarity at the next negative half-cycle thereof;

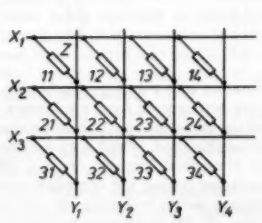
control means for rendering said second current path conducting at a selected non-zero value of said next negative half-cycle of the source voltage, again to form said free-wheeling path, so that said source voltage causes said arc voltage and arc current to reverse to a negative polarity; and

means for independently selecting said non-zero values of said positive and negative source voltage half-cycles such that said values have different phases relative to their respective source voltage half-cycles, whereby the corresponding positive and negative half-cycles of arc current have different durations to provide an unbalanced power supply.

4,038,516
THERMAL PRINTING HEAD

Bengt Allan Bergvall, Vasteras, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Feb. 20, 1975, Ser. No. 551,267
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **9 Claims**



1. A thermal printing head comprising a plurality of electric heating elements for recording information on a recording medium, a support member mounting said heating elements, said heating elements being varistor elements, said varistor elements each comprising a series combination of an element having non-linear current-voltage characteristics and a resistor having linear current-voltage characteristics, and means for

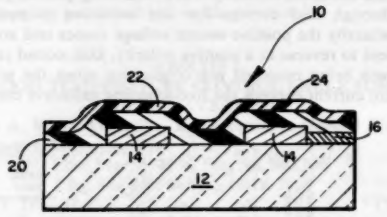
the selective supply of the electric current to at least one of said varistor elements.

4,038,517

ENVIRONMENTALLY AND WEAR PROTECTED GLASS SUBSTRATE THIN FILM THERMAL PRINTHEADS

Laurence G. Nelson, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 2, 1976, Ser. No. 673,249
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **5 Claims**



1. A thermal printhead comprising:

a glass substrate;

thin film thermal printing elements disposed on said substrate;

thin film conductors disposed on said substrate and electrically connected to said printing elements; and

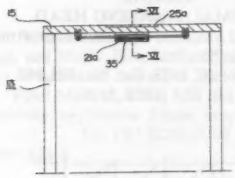
a protective overcoat consisting of a first layer of silicon monoxide disposed on said substrate, said printing elements and said conductors, and a second layer of a material selected from the group consisting of aluminum oxide, zirconium oxide, and chromium oxide.

4,038,518

DINING TABLE COMBINED WITH FOOD WARMING APPARATUS

Richard F. Morton, 200 Buzzard Roost Road, and David F. Hale, 508 E. First St., both of Mountain Home, Ark. 72653

Filed May 24, 1976, Ser. No. 689,650
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—218 **5 Claims**



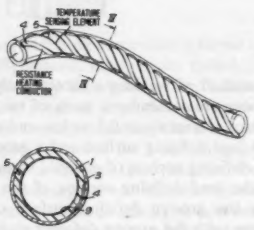
1. The combination with a dining table having a horizontally disposed table top constructed from a substance which readily permits flux linkage therethrough; of heat producing means for constantly maintaining food, which may selectively be placed in at least one prescribed location on said table top, at an optimum temperature during the complete course of a meal; said heat producing means including electric means disposed beneath said table top for generating at least one electromagnetic field each having a field of influence extending upwardly through said table top, and at least one peculiar food vessel means responsive to the field of influence when placed in said prescribed location; said food vessel means including conductor winding means inductively coupled to said electric means via the field of influence for generating an electromotive force therein, and heating element means electrically connected to said conductor winding means and being powered by said electromotive force for developing a nominal amount of heat whereby the food contained within said food vessel means may be maintained at the optimum temperature during the complete course of the meal; said food vessel means being in the form of a serving platter with said conductor winding means and said heater element means being embedded therein, and said food vessel means including cladding means for establishing an impervious exterior for said serving platter whereby said conductor winding means and said heater element means are sealably enveloped by said cladding means.

4,038,519

ELECTRICALLY HEATED FLEXIBLE TUBE HAVING TEMPERATURE MEASURING PROBE

Jacques Foucras, Bron, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 15, 1974, Ser. No. 524,210
Claims priority, application France, Nov. 15, 1973, 73.40688; Oct. 7, 1974, 74.33694
Int. Cl.[2] H05B *3/58;* A61M *5/14;* F16L *11/12;* F24H *1/10*
U.S. Cl. 219—301 **12 Claims**



1. A flexible heating tube, especially for medical use, comprising a flexible pipe of transparent plastics material, at least one electrical helical resistance heating conductor and at least one helical filiform temperature measuring resistance probe being wound on the same axis and being embedded in the wall of the said pipe, and in surrounding relation to the bore in the pipe, the helical turns of the at least one electrical resistance conductor and of the at least one temperature measuring probe being of the same pitch, and being coextensive along the length of the pipe and electrical connection terminals at at least one end of said pipe connected to said at least one heating conductor and said at least one temperature measuring probe.

4,038,520

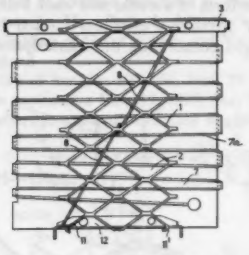
ELEMENT GUARDS FOR ELECTRIC TOASTERS

Gerd Boller, Karben; Karl Knott, Neu-Isenburg; Heinz Marburger, Frankfurt am Main; Norbert Voss, Offenbach (Main), and Manfred Wolf, Altheim, all of Germany, assignors to Rowenta-Werke GmbH, Germany

Filed June 2, 1975, Ser. No. 583,061
Claims priority, application Germany, June 6, 1974, 2427247; May 7, 1975, 2520354
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—521 **14 Claims**

1. In an electric toaster, the combination comprising a toaster heating element, an element guard, said guard including a grid and being formed from a sheet metal blank, the blank

having a slotted area which is expanded to form the grid, the area of the slotted area of the blank being substantially smaller



than the area of said grid, said guard being positioned with said grid in parallel spaced relation to said element.

4,038,521

AIMING DEVICE FOR FIRING ON MOVABLE TARGETS

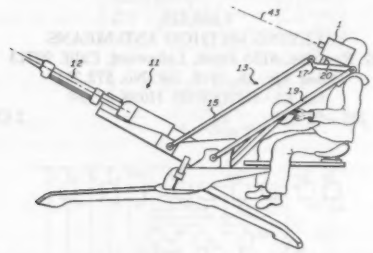
Martin Baumann, Muri near Bern, Switzerland, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 3, 1975, Ser. No. 636,903

Claims priority, application Switzerland, Dec. 11, 1974, 16345/74; Nov. 20, 1975, 15083/75

Int. Cl.[2] F41G *5/08;* G06F *15/58;* G06G *7/80*

U.S. Cl. 235—61.5 S **3 Claims**



1. An aiming device for aiming a weapon at a moving target comprising in combination:

A. a gun sight device including

1. means for measuring azimuth and sight angle of instantaneous positions of said moving target to establish an apparent path thereof;
2. means to visualize a target mark positioned relative to a lead point such that the distance between said target mark and said lead point is representative of a lead angle; and
3. signal controlled sight means to visualize said apparent path of said moving target and to set said target mark on said apparent path in accordance with said lead angle; and

B. a data processing device connected to said gun sight device for receiving digital signals indicative of said measurements and capable of furnishing signals necessary for the control of said signal controlled sight means including

1. means to store data of azimuth and sight angle of at least one instantaneous sighting of said moving target;
2. means to store data concerning ballistic characteristics of the ammunition for said weapon;
3. data input means adapted to receive digital signals representing target distance;
4. data input means adapted to receive digital signals representing target velocity; and
5. computing means to obtain from said angle data, said ballistic characteristics and said digital signals, control signals required to set said apparent path and said target mark in said signal controlled sight means.

4,038,522

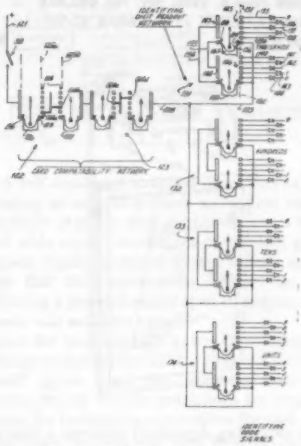
INTEGRATED CARD READER SYSTEM

Vernon T. Kleimeyer, and Thomas J. Schinner, both of Cincinnati, Ohio, assignors to General Signal Corporation, New York, N.Y.

Division of Ser. No. 563,655, March 31, 1975. This application Feb. 11, 1976, Ser. No. 657,052

Int. Cl.[2] G06K *5/00, 7/04*

U.S. Cl. 235—61.7 B **6 Claims**



1. An integrated card reader system adapted to read a card, said card having compatibility indicia and identifying indicia encoded thereon, said system comprising

an input line connectable to a central station, said input line being adapted to receive and interrogate signal,

an interrogate signal output line,

a card compatibility network connected in series with said input line and said output line, said compatibility network comprising at least one selectively preset switch arranged to define a prearranged circuit through a first section of said network, and at least one other selectively movable switch adapted for movement to establish different circuit paths between a series of compatibility terminals and a common terminal, said common terminal and at least one of said compatibility terminals being connected in series with said interrogate signal output line and said input line, said compatibility indicia of a card compatible with said reader system being operable to move said selectively movable switch into proper position to complete a circuit between said input line and said output line to activate said compatibility network upon insertion of a properly encoded card into said system,

a home position switch interposed in series with said output line, said home position switch being responsive to complete insertion of said card into said system so as to preliminarily activate said system,

at least one digit readout network connected in series with said compatibility network, said digit readout network having a series of digit readout lines each interconnected with a digit readout terminal, said readout network further including a first movable readout contact adapted to selectively move into cooperative engagement with each of said readout terminals yet remain connected in series with said interrogate signal output line,

said identifying indicia on said card being operable to position said movable readout contact from a rest position to an operative position where said movable readout contact

connects to the readout terminal with respect to which said identifying indicia is encoded,

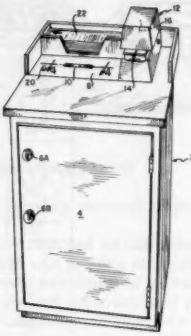
whereby the interrogate signal is gated through said home position switch, said compatibility network, and said digit readout network to provide a readout signal at the readout terminal if the card is coded such that same is compatible with the compatibility network.

4,038,523

RECEIPT VALIDATING BANK DEPOSITORY

John Robert Widmer, Hillsdale, and Arthur John Gloeckler, Cresskill, both of N.J., assignors to Widmer Time Recorder Co., Inc., New York, N.Y.

Filed June 4, 1976, Ser. No. 692,881
Int. Cl.[2] G06K *15/02*; B41K *45/00*
U.S. Cl. 235—61.9 R **9 Claims**



1. A receipt validating depository wherein a receipt ticket inserted by a depositor is validated only when a deposit is made and wherein no deposit may be made unless the depositor first inserts a deposit ticket for validation comprising:

means for validating a receipt ticket placed therein,

first sensing means for sensing the placment of said receipt ticket in said validating means,

a housing having a chamber in which said deposit is to be stored, said housing having an access way leading to said chamber through which the deposit can be made,

second sensing means for sensing the passage of the deposit through the access way to the chamber,

said validating means being responsive to said second sensing means for validating said deposit ticket only when a deposit is made,

means normally obstructing said access way, said obstructing means being responsive to said first sensing means for permitting communication between said access way and said chamber only after said receipt ticket is inserted in said validating means, and

switching means operatively connected to said obstructing means, said obstructing means being returned to its normal position obstructing said access way to prevent communication with said chamber in response to actuation of said switching means.

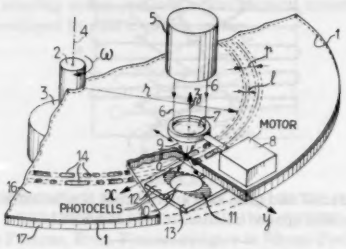
4,038,524

DATA CARRIER OPTICALLY READABLE BY TRANSMISSION AND METHOD OF MANUFACTURING SUCH A DATA CARRIER

Claude Puech; Claude Bricot; Bernard Carre; Jean Claude Dubois; Francois Le Carvennec, and Jean Claude Lehureau, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed June 17, 1975, Ser. No. 588,158
Claims priority, application France, June 21, 1974, 74.21662
Int. Cl.[2] G11B *19/02*; B32B *31/00*; G11B *7/14*; G11C *11/44*
U.S. Cl. 235—61.12 N **21 Claims**

1. A data carrier optically readable by transmission using an optical radiation, said data carrier comprising: a sheet of material transmitting said radiation; said sheet having at least one face carrying a permanent relief impression; said relief impression being in the form of a track; said track being made up of a succession of diffractive elements formed by alternating peaks and troughs constituting the transcription of a carrier



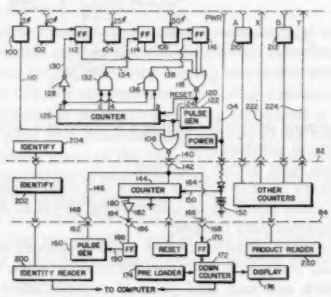
wave angularly modulated by said data; said data carrier further comprising at least one protective layer transmitting said radiation; said protective layer having smooth faces and adhering by one of said smooth faces to said peaks without filling up said troughs; the bottom of said troughs being in contact with a space having a refractive index substantially equal to unity.

4,038,525

TALLYING METHOD AND MEANS

Arthur G. Freeman, 6133 Faust, Lakewood, Calif. 90713

Filed Apr. 28, 1975, Ser. No. 572,281
Int. Cl.[2] G07D *9/00*; H03K *21/36*
U.S. Cl. 235—92 CN **2 Claims**



1. In an apparatus for tallying:

first signal generating means responsive to an event for generating signals upon the occurrence of said event;

second signal generating means for generating such signals independently of the occurrence of said event;

counting means in the form of a counter having a maximum capacity for counting signals from said first and second signal generating means until its capacity is reached;

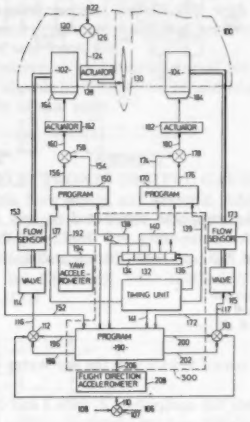
read-out means for counting the number of signals furnished to said counting means by said second signal generating means and for finding the difference between the maximum capacity of said counting means and the number of signals from first signal generating means which are counted by said counting means; and

means for preloading, to the maximum capacity of said counting means, one of said counting means or said read-out means.

4,038,526
OPTIMIZING CONTROL SYSTEM FOR AIRCRAFT

Edward Stuart Eccles, Cheltenham, and David James Moore, Bristol, both of England, assignors to The Secretary of State for Defence in Her Britanic Majesty's governmentof the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 419,654, Nov. 28, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 640,862
Claims priority, application United Kingdom, Dec. 29, 1967, 59029/67
Int. Cl.[2] G06F *15/46, 15/06*
U.S. Cl. 235—150.1 4 Claims



1. In an aircraft including: a power plant having at least two engines having respective gross thrust versus fuel flow characteristics and positioned on opposite sides of the longitudinal axis of the aircraft, a speed control loop for maintaining the speed of the aircraft substantially constant, and a direction control loop for maintaining the direction of the aircraft substantially constant, a method for optimizing the operating efficiency of the power plant to account for differences in the efficiencies of the engines by adjustably proportioning fuel flow to the engines, said method comprising the steps of:

a. simultaneously perturbing the fuel flow to each of said two engines a small amount, the respective perturbations being opposite in sign;

b. sensing acceleration in the aircraft flight direction produced in response to the perturbation of step (a);

c. comparing the sign of the perturbation in fuel flow to one of said engines with the sign of acceleration sensed as a result of the perturbations in fuel flow to the engines to determine if said signs are the same or opposite;

d. if said compared signs are the same, increasing fuel flow to said one engine and decreasing fuel flow by a like amount to the other of said engines;

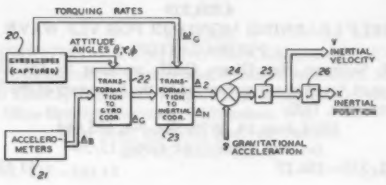
e. if said compared signs are opposite, decreasing fuel flow to said one engine and increasing fuel flow by a like amount to said other engine; and

f. repeating steps (a) through (e) until no net acceleration is sensed in response to perturbations of the fuel flow to said engines.

4,038,527
SIMPLIFIED STRAPPED DOWN INERTIAL NAVIGATION UTILIZING BANG-BANG GYRO TORQUING

Peter Michael Brodie, Oakland, and Edwin George Solov, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 21, 1975, Ser. No. 624,343
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.[2] G01C *21/16;* G06F *15/50*
U.S. Cl. 235—150.25 8 Claims



1. A self contained strapped down inertial guidance system combining all axis, all attitude navigation comprising:

a vehicle in which said inertial system is mounted,

two wide angle, two-degree-of-freedom gyros having their cases rigidly mounted to said vehicle said gyros oriented so that their momentum vectors are non-parallel and having a predetermined span of angular freedom between said null and spin axes,

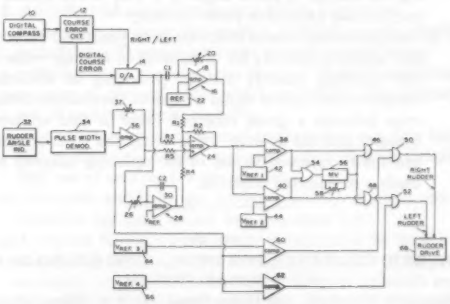
means for torquing said gyros at constant rates in a bang-bang torque fashion so that the long term torquing rates of said gyros equal the rotational rate of said vehicle whereby all vehicle restrictions are removed, and

means for computing corrections for said angular deviation between the null and spin axes by use of the electrical outputs of said gyro pickoffs.

4,038,528
AUTOMATIC PILOTING SYSTEM

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.

Filed Nov. 10, 1975, Ser. No. 630,539
Int. Cl.[2] B63H *25/24;* G06G *7/70*
U.S. Cl. 235—150.26 6 Claims



1. An automatic piloting system comprising:

a digital magnetic compass providing a digital output signal representative of magnetic compass heading;

digital means operative in response to said compass output signal to produce a course error signal representative of the difference between said compass heading and a desired course heading;

means operative in response to said course error signal to provide first and second signals representative of the integral and the derivative of course error, respectively;

rudder angle means operative to provide a signal representative of the present angular position of the rudder;

means for combining said first signal, said second signal, and said course error signal and for providing a control signal representative of the difference between the combined signal and said signal from said rudder angle means;

means defining a range of output signals within which no rudder control is provided; and

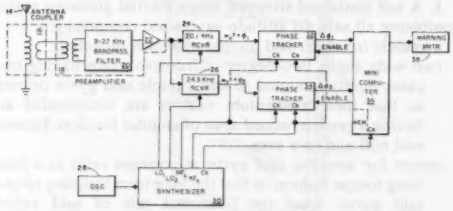
output gate means operative in response to said control signal and said range defining means for providing rudder control signals representing course errors outside of said range.

4,038,529

SELF LEARNING MONITOR FOR VLF WAVE PROPAGATION

Eric R. Swanson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 14, 1976, Ser. No. 695,614
Int. Cl.[2] G01S 7/44; G06F 15/50
U.S. Cl. 235—150.27 **11 Claims**



1. An apparatus for providing notice whenever a condition of VLF wave propagation becomes abnormal, wherein said condition is normal only when a detectable nunerical quantity has a value within an unspecified range of values, said apparatus comprising:

a. sensing means for sensing the value of said detectable quantity at successive points in time and for generating an updating quantity wherein a unique value of said updating quantity is generated for each different sensed value of said detectable quantity, said detectable quantity comprising the change in phase angle of a VLF wave sensed at each of said successive points in time;

b. data processing means receiving each generated value of said updating quantity for computing an average value of said updating quantity and for providing an abnormal condition notification signal whenever the absolute difference between a given received value of said updating quantity and the average value computed from selected previously received values of the updating quantity exceeds a preselected criterion.

4,038,530

HYBRID COMPUTER FOR DISPLAYING SOUND RAYS OF A SONAR SYSTEM

Masahiro Miyahara, and Hideo Suzuki, both of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed July 24, 1975, Ser. No. 598,567
Int. Cl.[2] G01S 9/66; G06F 15/20
U.S. Cl. 235—150.53 **3 Claims**

1. An apparatus for analyzing and displaying sound ray paths comprising:

a. a pair of switching means for setting sea depth (Z_i) and the temperature of sea water (T_i);

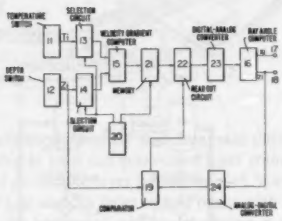
b. a velocity gradient computer connected to said switching means through a pair of selection circuits for computing a velocity gradient (g_i) with the equation

$$g_i = \frac{C_{i+1} - C_i}{Z_{i+1} - Z_i}$$

where Z_i, Z_{i+1}, are i-th and (i_+1)-th sea depth set by switches, and C_i and Ci_+1 are i-th and (i_+1)th sound velocity in the sea water at the depth Z_i and Z_{i+1}, respectively;

c. memory means connected to said velocity gradient computer for storing a plurality of sets of (g_i, Z_i) in a digital form;

d. a digital-analog converter connected to said memory means through a read out circuit for converting a set (g_i, Z_i) from a digital form to an analog form;



e. a ray angle computer connected to said digital analog converter for computing and displaying the coordinates (x, z) of the ray path with the equations;

$$\theta = -\int g_i \cos\theta dt$$
$$dx = C\cos\theta\, dt$$
$$dz = C \sin\theta\, dt$$

where C is a sound velocity in the sea water at the depth z, and

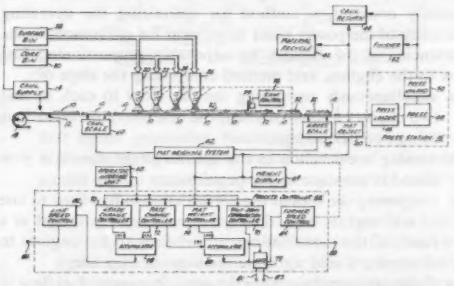
f. a comparator for comparing Z_i with z and controlling the operation of said read out circuit according to the result of the comparison.

4,038,531

PROCESS CONTROL APPARATUS FOR CONTROLLING A PARTICLEBOARD MANUFACTURING SYSTEM

Alton L. Loe, Jr., Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 18, 1976, Ser. No. 687,452
Int. Cl.[2] B29J 5/00; G05B 17/02, 13/02
U.S. Cl. 235—151.1 **21 Claims**



1. In a particleboard manufacturing system wherein mats having a predetermined length and width dimension are formed on a moving conveyor by a plurality of formers arranged to deposite a volume of resin coated wood particles for forming a web of loosely bonded wood particles, said web being trimmed to form said mats, the speed of said conveyor and the volume of said wood particles deposited by each of said formers being controllable by electrical signals to thereby

establish the weight of each of said mats, the improvement comprising:

weight control means for automatically controlling the weight of each mat produced by said manufacturing system, said weight control means including means for detecting the weight of each of said mats; means for detecting the weight error between the weight of each of said mats and a predetermined target weight, prediction means for determining a predicted weight error for each of said mats being produced by said system, said prediction means responsive to the difference between said weight error and said predicted error for each of said mats supplied by said manufacturing system; means for determining said difference between said weight error and said predicted error; signal conditioning means responsive to said difference between said weight error and said predicted weight error of each of said mats, said signal conditioning means supplying a control signal having a predetermined mathematical relationship with said difference between said weight error and said predicted weight error of each of said mats; and

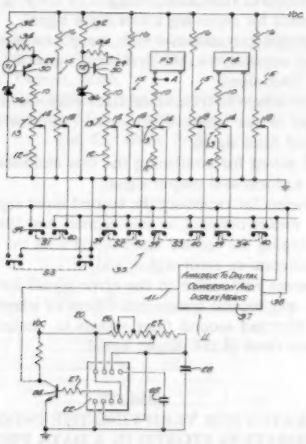
means responsive to said control signal for supplying said electrical signals to at least one of said formers to control the weight of said mats.

4,038,532

ELECTRONIC DIGITAL GAUGE

Robert E. Burris, New Berlin, and Lester E. Adams, Oak Creek, both of Wis., assignors to Prime Manufacturing Corporation, Oak Creek, Wis.

Filed Dec. 8, 1975, Ser. No. 638,366
Int. Cl.[2] G01K *7/10*; G01L *1/18*
U.S. Cl. 235—151.3 **10 Claims**



1. An electronic digital gauge for measuring the magnitude of a physical characteristic, said gauge comprising:

a. a transducer having a signal voltage which changes substantially linearly in response to a change in the physical characteristic to be measured, said signal voltage including a generally constant stand off voltage,

b. adjustable compensating scaling means for providing matching calibrated outputs, said calibrated outputs including a scaled output proportional to said signal voltage and a compensating output generally equal to a portion of said scaled output attributable to said stand off voltage,

c. analog to digital conversion and display means having an input adapted for receiving said matching calibrated outputs, and

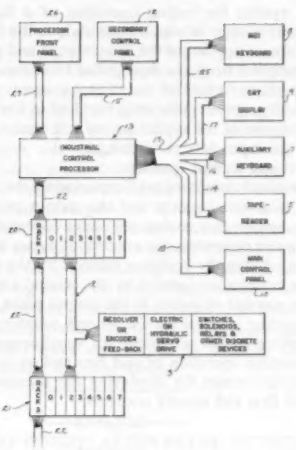
d. switching means for affording selectively connecting said matching calibrated outputs to said input, said compensating scaling means being adjustable to afford calibrating said scaled output and said compensating output of said matching calibrated outputs so that when said switching means connects said matching calibrated outputs to said input of said analog to digital conversion and display means, said analog to digital conversion and display means processes said matching calibrated output and provides a digital read out generally equal to the magnitude of the physical characteristic.

4,038,533

INDUSTRIAL CONTROL PROCESSOR SYSTEM

Ernst Dummermuth, Chesterland; William A. Donze, Mentor, and Timothy Bielawski, Maple Heights, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 29, 1976, Ser. No. 728,000
Int. Cl.[2] G06F *15/46*
U.S. Cl. 235—151.11 **22 Claims**



1. An industrial control processor which comprises:

a read/write memory for storing multi-bit words which include an I/O image table and program instructions;

a multi-lead data processor bus coupled to said read/write memory to convey words which are written into or read out of said read/write memory;

an instruction register connected to said processor data bus and operable to receive and store program instructions read out of said read/write memory;

an arithmetic and logic unit having a first set of inputs connected to the leads in said data processor bus;

an L register having a set of inputs connected to the leads in said data processor bus and a corresponding set of output terminals connected to a second set of input terminals on said arithmetic and logic unit;

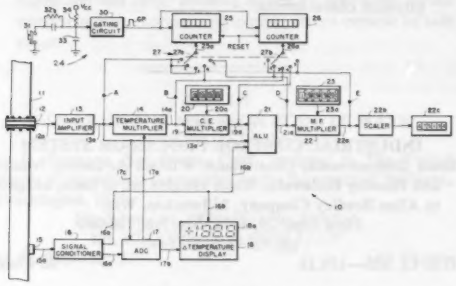
a bit pointer circuit having a set of inputs coupled to the instruction register to receive a bit pointer code contained in selected program instructions and having a set of output terminals connected to the respective leads in said processor data bus, said bit pointer circuit being responsive to received bit pointer codes to generate a mask on said processor data bus which is coupled to and stored in said L register;

wherein said mask is logically combined in said arithmetic and logic unit with a word read out of the I/O image table in said read/write memory to perform a logic operation on a selected single bit in said word.

4,038,534
METHODS AND SYSTEMS FOR USE WITH PULSE TRAIN CIRCUITRY

Mohammad Kian Mirdadian, 7015 Atwell, Houston, Tex. 77036

Filed Feb. 27, 1975, Ser. No. 553,834
Int. Cl.[2] G01F *1/08, 15/02*
U.S. Cl. 235—151.34 **34 Claims**



1. A system for testing operation of a digital computing circuit of the type in which input data in the form of an input pulse train is supplied to the circuit input and pulses are added to or removed from the input pulse train according to a relationship characteristic of said digital computing circuit so that the resulting output pulse train supplied to the circuit output is representative of the application of said characteristic relationship to the input data comprising:

a. first and second counters;

b. electrical circuit means for providing the input pulse train to said first counter and the output pulse train to said second counter so that the count accumulated by the first counter represents the number of pulses in the input pulse train during the counting interval for the first counter and the count accumulated by the second counter represents the number of pulses in the output pulse train during the counting interval for the second counter;

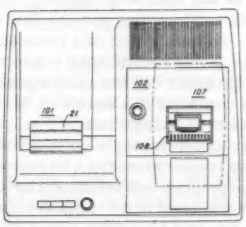
c. grating means actuatable for simultaneously starting the counting operation of said first and second counters; and

d. display means for displaying the accumulated counts in said first and second counters.

4,038,535
CALCULATOR-PRINT CRADLE SYSTEM

Bruce E. Aldridge, Dallas; Michael J. Cochran, Richardson; Lee G. Kitchens, Richardson; Robert R. Kressler, Richardson, and Stephen P. Hamilton, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 5, 1976, Ser. No. 646,463
Int. Cl.[2] G06F *15/02*
U.S. Cl. 235—152 **10 Claims**



1. A printing calculator system which comprises:

a. a portable electric calculator implemented on at least one integrated circuit semiconductor chip with entry means therein for entering both data and functions and for outputting data and instructions,

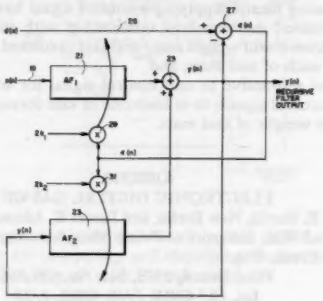
b. a cradle including a printer for receiving said calculator in a nest therein with a set of contacts in said nest for connecting the calculator to the cradle when in said nest, and

c. means including at least one integrated circuit semiconductor chip in said cradle to receive data for actuating said printer in response to the entering of data and functions at said entry means.

4,038,536
ADAPTIVE RECURSIVE LEAST MEAN SQUARE ERROR FILTER

Paul L. Feintuch, Covina, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 29, 1976, Ser. No. 671,889
Int. Cl.[2] G06F *15/34;* **H04B** *3/04*
U.S. Cl. 235—152 **17 Claims**



1. An adaptive filter comprising:

first means for receiving a first input signal;

a first adaptive transversal filter, coupled to said first means, being responsive to the first input signal for developing a first filter signal;

a second adaptive transversal filter responsive to an output signal of the adaptive recursive filter for developing a second filter signal;

second means for combining the first and second filter signals to form said output signal;

third means for receiving the second input signal;

fourth means coupled to said second and third means for combining the second input signal with the output signal to generate an error signal; and

fifth means responsive to the error signal for causing said first and second transversal filters to adaptively modify the first and second filter signals to minimize the mean square error in the output signal.

4,038,537
APPARATUS FOR VERIFYING THE INTEGRITY OF INFORMATION STORED IN A DATA PROCESSING SYSTEM MEMORY

Frank V. Cassarino, Jr., Weston; Thomas O. Holtey, Newton Lower Falls, and Douglas L. Rilkonen, Westford, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

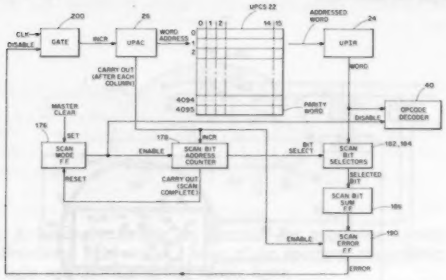
Filed Dec. 22, 1975, Ser. No. 643,453
Int. Cl.[2] G06F *11/10*
U.S. Cl. 235—153 AM **13 Claims**

1. Apparatus comprising:

A. means for storing information, said means for storing including a plurality of word locations, each for storing a word, each of said word locations including a plurality of bit locations, each for storing a bit, said bit locations in the same position in each of said word locations forming a column of bit locations, one of said word locations including a parity bit in each said bit location in order to indicate the integrity of said information on a said column basis;

B. means for sequentially accessing said words in each of said word locations in said means for storing;

C. column selector means for accessing one bit in the same bit location for each of said words accessed from said word locations, thereby selecting one of said columns for the purpose of indicating the integrity of the contents thereof;



D. means for adding the value of the accessed bits for the same bit location in each of said accessed words until all of said bits in one said column identified by said same bit location are added together thereby generating a final value; and

E. means for detecting whether said final value indicates an error condition.

4,038,538

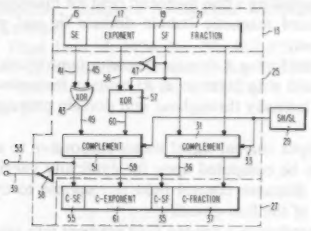
INTEGER AND FLOATING POINT TO BINARY CONVERTER

Carl Frederick Semmelhaack, West Chester, and Mark Camillo DiVecchio, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 605,251, Aug. 18, 1975, Pat. No. 4,007,439. This application May 12, 1976, Ser. No. 685,615

Int. Cl.[2] G06F *5/00*

U.S. Cl. 235—154 **3 Claims**



1. A converter for use in a logic element storing a numerical digital value having an exponent sign bit, an exponent field, an integer/fraction sign bit, and an integer/fraction field, said converter comprising:

controller means having a first and a second logical state for controlling conversion of said numerical digital value;

means for complementing said exponent sign bit when both said integer/fraction sign bit equals a logical zero and said controller means is in said first logical state and when both said integer/fraction sign bit equals a logical one and said controller means is in said second logical state;

means for complementing said exponent field when both said integer/fraction sign bit equals a logical one and said controller means is in said first logical state and when both said integer/fraction sign bit equals a logical zero and said controller means is in said second logical state;

means for complementing said integer/fraction field when said controller means is in said second logical state; and

means for complementing said integer/fraction bit when said controller means is in said first logical state.

4,038,539

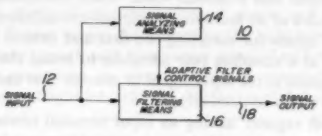
ADAPTIVE PULSE PROCESSING MEANS AND METHOD

James R. Van Cleave, Furlong, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Feb. 23, 1976, Ser. No. 660,230

Int. Cl.[2] G06F *15/34*; H04B *3/04*

U.S. Cl. 235—156 **106 Claims**



1. A signal processing means for pulse signals which are received with noise signals comprising terminal means for receiving input signals including pulse and noise signals with the pulse signals occurring at unknown times and having unknown durations; signal filtering means having a first input receiving signals derived from said terminal means, a second input and an output; said signal filtering means having a controllable filter characteristic for passing signals from its first input to its output responsive to signals received at its second input; and a signal analyzing means having an input receiving signals derived from said terminal means and an output delivering signals which are responsive to signals currently received at its input without using previous signals, to the second input of said signal filtering means for controlling its filter characteristic; whereby the output of said signal filtering means delivers signals corresponding to the pulse signals of the input signals of said terminal means while minimizing the delivery of noise signals received at said terminal means.

4,038,540

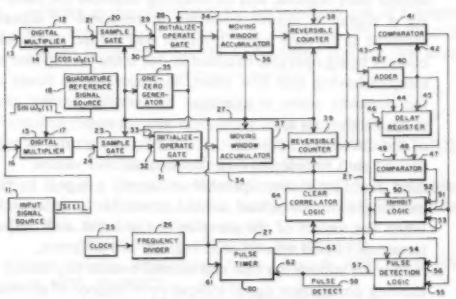
QUADRATURE CORRELATION PULSE DETECTOR

James L. Roberts, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 19, 1976, Ser. No. 678,016

Int. Cl.[2] G06F *15/34*; G01S *9/23*

U.S. Cl. 235—181 **12 Claims**



1. Pulse detection apparatus for detecting tone pulses of a known duration and carrier frequency in a signal in which random noise is present, comprising in combination:

input means for supplying an input signal in which tone pulses are to be detected;

clipping means for hard limiting the input signal to produce a clipped signal having either of two instantaneous amplitudes;

a reference signal source for generating first and second square wave signals comprising quadrature components of a square wave reference signal having a repetition rate equal to said carrier frequency and either of two instantaneous amplitudes substantially equal to those of the clipped signal;

first and second digital multiplication means for multiplying the clipped signal and each of the first and second square wave signals to produce first and second product signals respectively, each having a first value when the instantaneous amplitudes of its multiplicand signals are substantially equal and a second value when the instantaneous amplitudes of its multiplicand signals are different;

sampling means for sampling the first and second product signals at a sampling rate adequate to retain the desired information in the input signal to provide first and second sample trains respectively;

a first shift register having an input terminal connected to receive the first sample train, an output terminal for subsequently supplying the first sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

a first reversible counter having a data input terminal connected to receive the first sample train from said first shift register, and an enabling terminal for receiving a signal to permit counting in response to samples received at the data input terminal, said first reversible counter being operable to count in one sense in response to samples having said first value, and operable to count in the opposite sense in response to samples having said second value, so as to produce a first count indicative of the difference between the numbers of samples in said first shift register having first and second values;

first enabling means operable to supply a signal to the enabling terminal of said first reversible counter only when the values of the samples at the input and output terminals of said first shift register means are different;

a second shift register having an input terminal connected to receive the second sample train, an output terminal for subsequently supplying the second sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

second reversible counted means having a data input terminal connected to receive the second sample train from said second shift register, and an enabling terminal for receiving a signal to permit counting in response to signals received at the data input terminal, said second reversible counter being operable to count in one sense in response to samples having said first value, and operable to count in the opposite sense in response to samples having said second value, so as to produce a second count indicative of the difference between the numbers of samples in said second shift register having first and second values;

second enabling means operable to supply a signal to the enabling terminal of said second reversible counter only when the values of the samples at the input and output terminals of said second shift register are different;

an adder for adding the first and second counts to produce a moving correlation signal indicative of degree of correlation between the input signal and the square wave reference signal; and

a first comparator for comparing the moving correlation signal with a threshold reference signal indicative of a correlation threshold, and producing a pulse indication signal when the moving correlation signal indicates correlation greater than the correlation threshold.

4,038,541

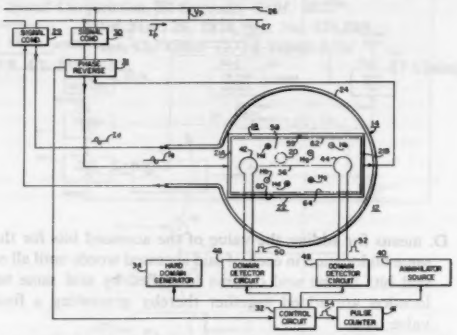
HARD MAGNETIC BUBBLE DOMAIN ANALOG MULTIPLIER

Aleksander I. Braginski, Plum Borough, and Terence W. O'Keeffe, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,512

Int. Cl.[2] G06G *7/16*; G11C *11/14*

U.S. Cl. 235—194 **13 Claims**



1. A hard magnetic bubble domain analog multiplier comprising:

a strip layer of hard bubble domain magnetic material capable of sustaining a hard bubble domain, said strip layer having an elongated area therein defining a bubble domain propagating channel, said channel having an axis of net displacement of bubble domain motion extending substantially parallel to opposite side boundaries of said propagating channel;

means including a bias magnetic field for maintaining at least one hard magnetic bubble domain in said propagating channel;

means producing a domain diameter control magnetic field into said strip layer so as to have an instantaneously uniform intensity throughout said domain propagating channel;

a first input current signal means responsive to a first quantity to be computed upon for cyclically varying said domain diameter control field in response to cyclic variations of the first quantity;

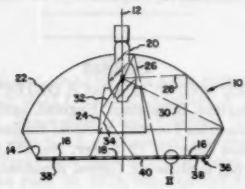
means producing a driving field gradient into said strip layer so as to have a gradient direction of maximum increasing intensity across said domain propagating channel so that the direction of the driving field gradient is substantially perpendicular to the net displacement axis;

a second input signal means for cyclically varying said driving field gradient in response to the cyclic variations of a second quantity to be computed upon by being multiplied by said first quantity whereby the combined cyclic variations of said domain diameter control field and said driving field gradient produce orbital domain movements having average movement along the net displacement axis of said domain propagating channel at an average velocity directly proportional to the product of said domain diameter control field and said driving field gradient thereby producing a domain net displacement proportional to the time integral of the product of said first and second quantities.

4,038,542
LUMINAIRE FOR CONTROLLING LOCALLY UNIDIRECTIONAL LIGHT

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 21, 1975, Ser. No. 597,846
Int. Cl.[2] F21V *13/00*
U.S. Cl. 240—92 5 Claims



1. A luminaire having an aperture for providing locally unidirectional light across a zone of the aperture, comprising:

a light source for emitting visible light;

reflector means for reflecting a portion of light emitted from said light source through a first zone of the aperture to provide a first zonal illumination area and for providing light of substantially uniform flux across the first zone;

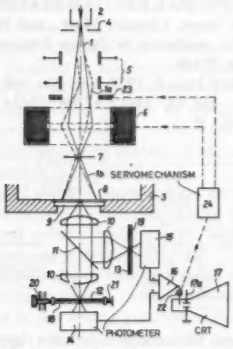
deviator means disposed within said reflector means for preventing the direct passage of light from said light source to the first zone and for directing a second portion of light emitted from said light source through a second zone of the aperture to provide a second zonal illumination area, the deviator and reflector means being constructed to provide substantially equal zonal illumination of the first and second areas; and

light modifying means disposed across the aperture for controlling the locally unidirectional light passing through at least the first zone by critically reflecting and then refracting such light into a control range.

4,038,543
SCANNING TRANSMISSION ELECTRON MICROSCOPE INCLUDING AN IMPROVED IMAGE DETECTOR

Burkhard Krisch; Lee H. Veneklasen, and Dieter Willasch, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 15, 1976, Ser. No. 696,475
Claims priority, application Germany, July 8, 1975, 2530844
Int. Cl.[2] H01J *37/26*; G01N *23/04*
U.S. Cl. 250—307 15 Claims



1. In a scanning transmission electron microscope including an evacuated housing and a phase contrast device, and in which the imaging ray cone of the microscope generates a hologram having zones of positive or negative interference, said microscope also including means for separately detecting and measuring the intensities of said zones of positive or negative interference and display means coupled to and controlled by said detecting means for monitoring said intensities, the improvement comprising said means for detecting comprising

image conversion means, disposed in the electron beam path of said microscope, on which said hologram is projected for converting said hologram into an optical image;

planar mask means, disposed outside of said microscope housing, having transparent and opaque areas which correspond to said zones of positive and negative interference of said hologram;

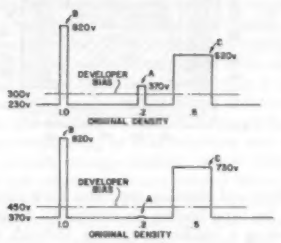
means, disposed adjacent said image conversion means, for transmitting said optical image with unchanged relative intensity distribution to said mask means; and

means, disposed adjacent said mask means and coupled to said display means, for measuring the light intensity transmitted through said transparent areas of said mask means and generating an output signal corresponding to the measured light intensity for display on said display means.

4,038,544
APPARATUS AND METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE

Vittal U. Shenoy, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,238
Int. Cl.[2] G03G *15/00*
U.S. Cl. 250—315 R 4 Claims



1. The method of treating an electrostatic latent image having a background area charged to a first level, a first area charged to a second level which is higher than the first level, and a second area charged to a third level which is higher than the second level comprising:

depositing a charge onto the latent image of the same polarity as the polarity of the background and of a magnitude sufficient to substantially eliminate the contrast in charge levels between the background and the first area.

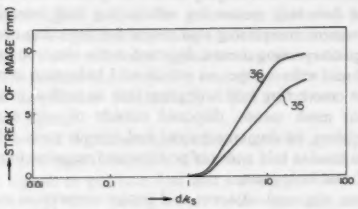
4,038,545
ELECTROSTATIC RECORDING PROCESS AND IONIZING RADIATION IMAGE RECORDING METHOD EMPLOYING THE SAME

Takao Komaki; Kazuo Horikawa; Satoru Honjo, and Seiji Matsumoto, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 7, 1976, Ser. No. 693,641
Claims priority, application Japan, June 6, 1975, 50-68369; June 9, 1975, 50-69387
Int. Cl.[2] G03G *13/00, 15/00*
U.S. Cl. 250—315 A 2 Claims

1. An electrostatic recording method comprising the steps of forming an electrostatic latent image on the surface of a dielectric electrostatic recording layer provided on a support at least the surface of which is conductive, the ratio of the thickness of said electrostatic recording layer $d[\mu m]$ to the specific dielec-

tric constant thereof ϵ_s being not larger than 1.65[μm] when a reflection type image is formed on said layer, and being not



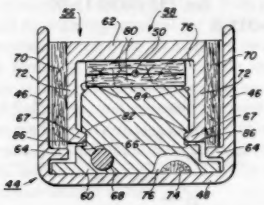
larger than 1.5[μm] when a transmission type image is formed thereon, and developing said electrostatic latent image by use of an electrophotographic liquid developer.

4,038,546

CLEANING APPARATUS FOR A CORONA GENERATING DEVICE

Stefan A. Jasinski, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,828
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—324 **6 Claims**



1. An improved cleaning apparatus for a corona generating device of the type having an elongated generally U-shaped shield defining a discharge opening through which ions are emitted, and a corona wire mounted within and extending along the shield, wherein the improvement comprises:

a. a block, and means for slidably mounting and retaining the block within the shield so that the block can be moved back and forth along the shield;

b. a cap having shield cleaning means thereon for cleaning at least a portion of the interior surface of the shield; and

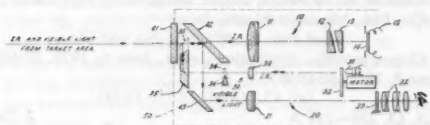
c. means for locking the cap into an operative position as the cap is being pushed over the corona wire and block.

4,038,547

TRACKING AND SIGHTING INSTRUMENT

Howard F. Hoesterey, Santa Ana, Calif., assignor to Philco Corporation, Dearborn, Mich.

Filed May 31, 1966, Ser. No. 553,790
Int. Cl.[2] F41G *11/00*
U.S. Cl. 250—338 **7 Claims**



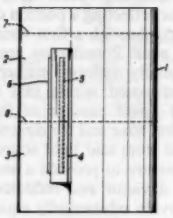
1. Missile tracking and target sighting apparatus of the type which receives conjoint, generally parallel beams of incident visible and infrared light, coming respectively from a target and a missile, said apparatus comprising means for initially splitting the incident conjoint light beams into separate beams of infrared and visible light respectively; a first objective, disposed in the path of the visible light beam and focusing the light thereof into target-sighting ocular means; and a second and separate objective, disposed in the path of the infrared light beam and focusing the light of the latter beam into missile-tracking receiver means, said first and second objectives being highly transmissive, respectively, to visible light and to infrared light.

4,038,548

LEVEL AND INTERFACE DETECTION

John Stuart Charlton, Billingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 19, 1975, Ser. No. 588,647
Claims priority, application United Kingdom, June 21, 1974, 27644/74
Int. Cl.[2] G01F *23/00*; G01T *3/00*
U.S. Cl. 250—357 **12 Claims**



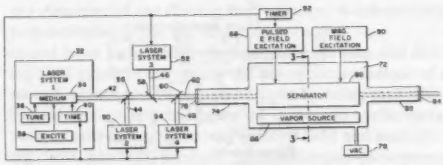
1. Equipment for determing the position of the interface between two liquids in a vessel, both liquids having a moderating effect on fast neutrons and being selected from the group consisting of liquids having differing abilities to moderate fast neutrons, liquids having differing abilities to absorb slow neutrons and liquids having different abilities to moderate fast neutrons and to absorb slow neutrons comprising an emitter of fast neutrons, which in use is positioned adjacent the vessel and an associated detector of slow neutrons, which in use is placed adjacent the vessel to receive at least some of the slow neutrons emerging from the vessel.

4,038,549

ISOTOPICALLY SELECTIVE EXCITATION FROM PLURAL EXCITED STATES

George Sargent Janes, Lincoln, Mass., and Richard H. Levy, Seattle, Wash., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 8, 1973, Ser. No. 368,298
Int. Cl.[2] H01J *37/08, 39/34*
U.S. Cl. 250—423 P **29 Claims**



28. In a system for isotope separation, apparatus for selectively exciting particles of one isotope type in an environment of plural isotope types in which the plural isotope type particles populate the ground and one or more other low-lying energy states to a substantial degree, said apparatus including:

means for applying first radiant energy to said environment

to produce selective excitation of said particles of said one isotope type from the ground energy state to a substantially excited energy state; and

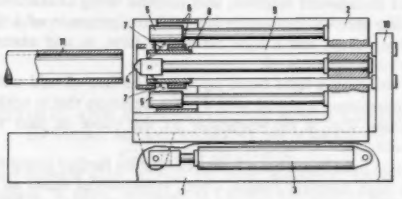
means for applying a second radiant energy to said environment to produce selective excitation of further particles of said one isotope type from the one or more other populated low-lying excited energy states to a substantially excited energy state.

4,038,550

METHOD AND AN APPARATUS FOR THE MEASURING OF THE WALL THICKNESS OF A TUBE

Johann Wassen, Brackwede; Gunter Schulz, Dusseldorf, and Gunter Ivens, Julich, all of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed June 30, 1975, Ser. No. 591,532
Claims priority, application Germany, Aug. 20, 1974, 2440274
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—358 P 2 Claims



1. Apparatus for measuring the wall thickness of a tube comprising:

a bed adapted to mount said tube;

a reciprocal carriage mounted on said bed for movements longitudinally of the tube axis;

reciprocal means on said bed connected to said carriage;

said carriage having an advanced testing position and a retracted position;

a stationary calibration tube of predetermined wall thickness axially aligned with the tube to be tested, and mounted on and overlying said bed;

a holding bar coaxial of and within said tubes anchored to said carriage and at one end mounting a radiation source;

said source in the retracted position of said carriage being nested within said calibration tube, and in the testing position of said carriage, nested within the tube whose wall thickness is to be measured;

a pair of concentric inner and outer tubular radiation protection sleeves mounted on said carriage enclosing the radiation element and adapted to alternately receive and enclose the corresponding portion of the tube to be tested when the carriage is in testing position and to receive and enclose the corresponding portion of the calibration tube when the carriage is retracted;

and a plurality of parallel equiangularly arranged scintillation counters parallel to said rod secured to said carriage and positioned around said radiation element, and disposed between said protection sleeves;

the inner protection sleeve having a series of window-like apertures through which radiation from the radiation source passes in the testing position of the carriage after passing through the wall of the tube to be tested and respectively, in the retracted position of the carriage after passing through the wall of the calibration tube;

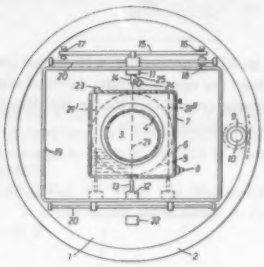
said scintillating counters adapted for connection to apparatus including means for indicating and detecting values received from said scintillation counters.

4,038,551

CIRCUIT FOR PROCESSING SIGNAL DATA OBTAINED FROM AN AXIAL TOMOGRAPHIC SCANNING APPARATUS

Christopher Archibald Gordon LeMay, Osterley, England, assignor to E M I Limited, Haynes, England

Division of Ser. No. 462,104, April 18, 1974, Pat. No. 3,924,129.
This application Sept. 2, 1975, Ser. No. 609,718
Claims priority, application United Kingdom, Apr. 25, 1973, 19528/73; Aug. 21, 1973, 39420/73; Oct. 11, 1973, 47507/73
Int. Cl.[2] G01N *21/34*
U.S. Cl. 250—445 T 8 Claims



1. Apparatus for examining a substantially planar section of a body by means of penetrating radiation, especially X-or γ -radiation, comprising a source of the radiation, a detecting arrangement for detecting radiation emergency from the section along at least one beam, scanning means arranged to cause said detecting arrangement to provide data signals representing the transmission or absorption of radiation passing through the section along sets of beams orientated at different angles in said section, and circuit means for constructing a representation of the transmission or absorption of said radiation at different locations in said section, the circuit means including storage elements corresponding to said locations and means for accumulating, in each storage element, signals derived from the data signals and relating to beams passing through or adjacent the corresponding locations, the improvement comprising; a signal modifying device having input and output connections and a recirculatory signal path linking said input and output connections, means for applying the data signals relating to a set of beams, in regular time sequence, to said input connection, a multiplying circuit for multiplying, by a factor less than unity, signals traversing said signal path and for applying the product to said input connection and means for combining said product with the next signal in said sequence so that, as the data signals relating to a set of beams are applied sequentially to said input connection, output signals appear in succession at said output connection, each corresponding to a respective one of said data signals and some at least of said output signals including contributions from other data signals of the same set each said contribution comprising a data signal multiplied by a respective one of a series of progressively diminishing factors, related to the spacing between the beam to which said respective one of said data signals relates and the beams to which said other data signals relate, means being provided for distributing the output signals so derived to the storage elements corresponding to the locations in said section intersected by the beam to which said respective one of said data signals relates.

4,038,552

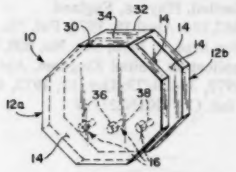
LUMINOUS SAFETY DEVICE

Anne Louise Ciofalo, 310 Lakeshore Drive, Haworth, N.J. 07641

Filed June 16, 1976, Ser. No. 696,781
Int. Cl.[2] F21K *2/00*
U.S. Cl. 250—462 3 Claims

1. A safety device comprising a pair of octagonal plates and

a living hinge secured therebetween along adjacently disposed edges thereof to thereby integrally and hingedly connect said plates, said plates and said hinge element being formed in a



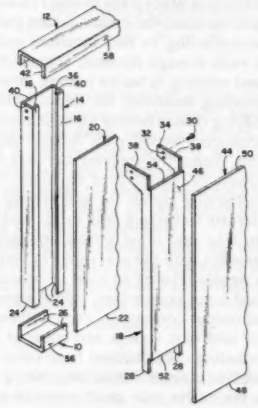
single step by a molding procedure, a luminous material being provided on at least the opposed outer faces of said plates, and separable cooperable connecting means for detachably securing said plates to a selected object.

4,038,553

RADIATION SHIELDING APPARATUS

Ralph J. McCullagh, 11221 NW. 43rd St., Coral Springs, Fla. 33065

Filed Aug. 24, 1976, Ser. No. 717,111
Int. Cl.[2] G21F *3/04*
U.S. Cl. 250—517 **6 Claims**



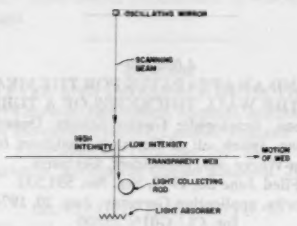
1. A radiation shielding apparatus comprising a pair of U-shaped tracks, a first element having a U-shaped cross-section and a pair of inwardly turned flanges fixedly secured to the free longitudinal edges thereof, a second element having a U-shaped cross-section and a pair of arms extending the length of the legs of said U-shaped cross-section, said pair of arms fixedly secured to said legs adjacent one end of said second element, means to removably fasten said pair of arms to portions of said first element adjacent one end thereof, means to clampingly secure lead sheeting between said first element and said second element, means to confine said one end of said first element and said one end of said second element within one of said pair of U-shaped tracks, means to confine the other end of said first element and the other end of said second element within the other of said pair of U-shaped tracks.

4,038,554

DETECTION OF FLAWS IN A MOVING WEB OF TRANSPARENT MATERIAL

Dwin R. Craig, Gaithersburg, Md., assignor to Columbia Research Corporation, Gaithersburg, Md.

Filed Mar. 9, 1976, Ser. No. 665,354
Int. Cl.[2] G01N *21/32*
U.S. Cl. 250—572 **14 Claims**



1. A method for detection of flaws in a substantially planar web of transparent material, said method being characterized by being able to distinguish between the presence of a light absorbing flaw, and a light refracting flaw, in said material, comprising the steps of:

A. directing a light beam upon one surface of said web of transparent material with a beam direction that is within a plane that is perpendicular to the plane of said web; wherein,

B. said light beam has a light distribution further comprising a high intensity central cores, symmetrical about an axis colinear with said beam direction, and surrounded by an annular disk of significantly lower intensity; and

C. passively absorbing all of said high intensity light distribution which remains directed in the plane of said beam direction after passing through said transparent web material; while

D. impinging at least a portion of that low intensity disk, which remains directed in the plane of said beam direction after passing through said web, onto a photoelectric signal generating means; and

E. generating a constant intermediate signal in said photoelectric signal generating means in response to the said impingement of said low intensity disk, whereby a light refracting flaw is operable to deviate said high intensity core to produce a signal of a first polarity, and a light absorbing flaw is operable to generate a signal of the opposite polarity.

4,038,555

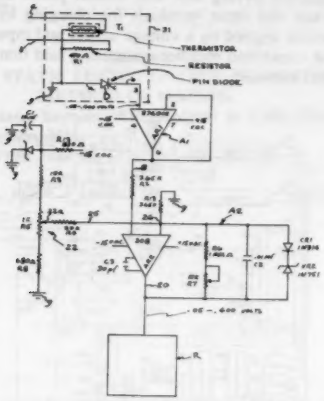
PHOTOMETRIC MEASURING SYSTEM

Gary M. Freeman, Houston, Tex., assignor to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Filed Aug. 28, 1974, Ser. No. 501,272
Int. Cl.[2] G01N *21/24*
U.S. Cl. 250—573 **3 Claims**

1. An asborption photometric measurement system comprising, a light source for projecting light onto a liquid sample under test, a photodiode disposed in light interrrupting position with respect to the light passing through said sample, signal amplifier means having a high impedance input and an input bias current less than ten pico amperes, said photodiode having its anode-cathode circuit connected in series circuit relation between the input of said amplifier means and the system ground, said photodiode being operable to provide an open circuit voltage signal across its anode-cathode junction whose magnitude is linearly proportioned to the absorbance of the sample under test, and second circuit means operably connected to the amplifier means and including means adjustable to preset said second circuit means at a preselected opera-

tional level whereby said amplifier means is responsive to the output signal of said photodiode to provide a signal that is



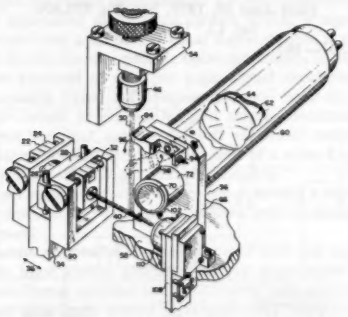
directly representative of the absorbance of light by said sample under test.

4,038,556

METHOD AND APPARATUS FOR SIMULTANEOUS OPTICAL MEASUREMENT OF PARTICLE CHARACTERISTICS

Robert Edward Auer, Miami, Fla., and Howard E. Tucker, Los Alamos, N. Mex., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 14, 1976, Ser. No. 695,475
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—575 **54 Claims**



1. An apparatus for simultaneous optical measurement of several characteristics of each particle of a group of small particles while the particles are suspended in a liquid including in combination:

a sample passage means through which the particles pass,

a first optical detector for receiving light from said sample passage means and for developing first detection signals in response to said received light,

means for moving one of said sample passage means and said optical detector with respect to the other for aligning one with respect to the other,

a source of light,

means for directing light from said light source to said sample passage means and for aligning said light and sample passage means,

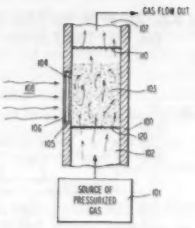
a second optical detector for receiving light from said sample passage means and for developing second detection signals in response to said received light, said second detector including a converging lens for receiving said light from said sample passage means and photodetector means positioned a predetermined distance from said focusing lens for receiving said light from said lens, said predetermined distance selected such that the light pattern received by said photodetector due to the passage of a particle through the sample passage means will maintain a substantially constant intensity with movement of any of said sample passage means, particle and light whereby said detector means is insensitive to the movement of any of said sample passage means, first optical detector, light source and particle.

4,038,557

PARTICULATE ENERGY ABSORBER

Oliver DeP. Gildersleeve, Jr., 109 Deepdale Road, Strafford, Pa. 19087, and George A. Hunger, Jr., 410 W. Palmer St., Morrisville, Pa. 19067

Filed Feb. 12, 1975, Ser. No. 549,152
Int. Cl.[2] H02P *9/04*; G02B *5/10*
U.S. Cl. 290—1 R **24 Claims**



1. Apparatus for converting radiant energy from a specified source to thermal energy comprising:

a. a housing defining a chamber therein;

b. a predetermined quantity of solid particulate material in said chamber, capable of absorbing radiant energy;

c. means for supplying gas to said particulate material at a pressure and rate which suspends said particulate material in a fluidized bed condition within said chamber; and

d. means for coupling radiant energy to said particulate material while simultaneously maintaining said fluidized bed condition, for absorption of radiant energy by said particulate matter and thermal transfer from said particulate matter to said gas.

4,038,558

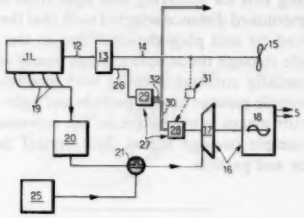
ELECTRIC POWER GENERATING DEVICE FED WITH ENERGY RECOVERED FROM THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Jacques Gallois, Paris, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Oct. 10, 1975, Ser. No. 621,501
Claims priority, application France, Dec. 23, 1974, 74.42533
Int. Cl.[2] F02G *3/02*
U.S. Cl. 290—52 **5 Claims**

1. An electric power generating device operated by recovering the energy from the exhaust gases of an internal combustion engine, comprising speed-reducing means mounted between said engine and a transmission shaft and a turbo-alternator set driven by said energy taken from said exhaust gases, the turbine of said turbo-alternator set being operatively coupled to said speed-reducing means, wherein the improvement con-

sists in that said turbine is operatively coupled to said speed-reducing means through the agency of a (variable-speed re-



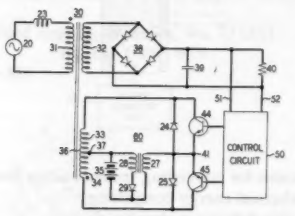
versible transmission member) keyed in follow-up relationship to the actual speed variations of said transmission shaft.

4,038,559

REGULATED UNINTERRUPTIBLE POWER SUPPLY

Ping Sun Chun, Morristown; Patrick William Clarke, Murray Hill, and Kenneth William Gardner, Hopatcong, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 23, 1976, Ser. No. 651,644
Int. Cl.[2] H02J *9/00*
U.S. Cl. 307—64 **24 Claims**



1. An uninterruptible power supply comprising

a power transformer including a first, second, and third access winding,

means for accepting an AC source coupled to said first winding,

means for accepting a load coupled to said second winding,

power flow control means including gating means coupled to said third winding, means for accepting a reserve source of energy coupled to said gating means, first means for controlling said gating means in order to short-circuit said third winding for controlled intervals of time, and second means for controlling said gating means to enable power flow from said reserve source of energy to said second winding.

4,038,560

PULSE SHAPING CIRCUIT FOR SHRIMP FISHING APPARATUS LOAD

James L. Newman, 1321 Glen Cove, Richardson, Tex. 75080, and M. Marion Hawthorne, 4824 Overton, Fort Worth, Tex. 76133

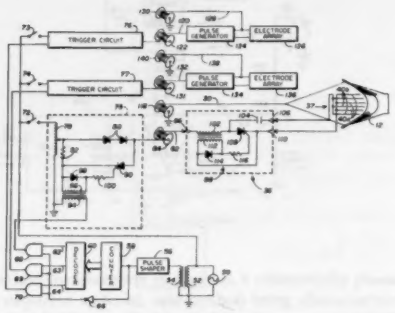
Continuation of Ser. No. 303,412, Nov. 3, 1972, abandoned, which is a division of Ser. No. 883,187, Dec. 8, 1969, abandoned. This application Aug. 23, 1974, Ser. No. 500,146
Int. Cl.[2] H03K *3/00*
U.S. Cl. 307—106 **14 Claims**

1. A pulse circuit comprisng:

first, second and third terminals, said first and second terminals comprising input terminals and said second and third terminals comprising output terminals for the pulse circuit;

a capacitor having first and second plates connected between said input terminals for charging by a charging current applied by a voltage across said input terminals;

a gate controlled rectifier connecting said first plate to the third terminal;



means connected to said input terminals for initiating a discharging current between the capacitor and the first terminal said discharging current having a polarity opposite to the charging current; and

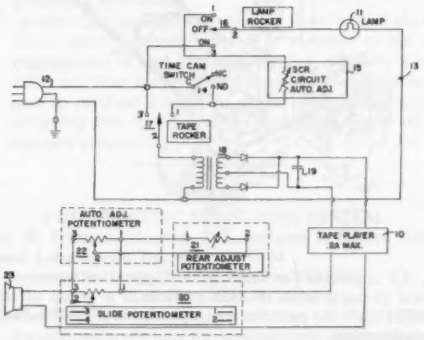
gate circuit means connected to said gate controlled rectifier and responsive to said discharging current for turning the gate controlled rectifier on to discharge the capacitor through a load connected between the terminals.

4,038,561

CHILDREN'S LAMP

Michael Lorenz, 421 55th St., Downers Grove, Ill. 60515

Filed June 30, 1975, Ser. No. 591,456
Int. Cl.[2] H01H *43/00*
U.S. Cl. 307—141 **1 Claim**



1. A combination audio, light and timing mechanism adapted to provide light and sound under control of said timing mechanism including an electrical circuit for the light and an audio device and a source of power energizing the circuit, an automatic adjusting SCR circuit device in said electrical circuit, a pair of rocker switches disposed in circuit with said timing mechanism and said SCR circuit device each comprising a single pole double throw switch, potentiometer means in the electrical circuit including an automatic adjusting potentiometer and an adjustable potentiometer operating in circuit with a variable slide potentiometer with the automatic adjusting potentiometer and the adjustable potentiometer disposed in series parallel to provide a dual potentiometer circuit, a step-down

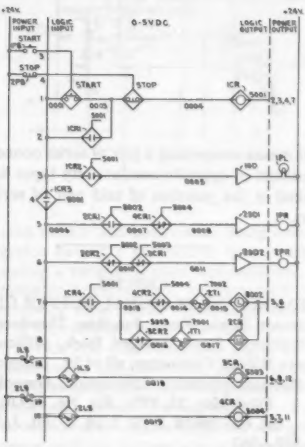
transformer in the electrical circuit, and speaker means projecting said sound, said potentiometer means being disposed in the electrical circuit between said audio device and said speaker means.

4,038,562

LADDER STATIC LOGIC CONTROL SYSTEM AND METHOD OF MAKING

Paul M. Kintner, Bayside, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 16, 1972, Ser. No. 263,712
Int. Cl.[2] H03K *19/08*
U.S. Cl. 307—203 **34 Claims**



1. In a static logic control system, a logic system that is the static logic functional equivalent of a relay comprising:

a coil equivalent static logic circuit having a signal input terminal and a single electrical signal, output terminal;

means in said circuit operable upon application to said signal input terminal of an input logic signal simulating a coil energizing signal for causing said coil equivalent static logic circuit to provide at said single, electrical signal, output terminal a time delayed electrical output logic signal simulating the operating time of a relay for contact equivalent static logic circuit operation;

a contact equivalent static logic circuit having a signal input terminal, a signal output terminal and a control input terminal;

and means responsive to application of said coil equivalent static logic circuit electrical output logic signal to said control input terminal for conditioning said contact equivalent static logic circuit to control logic signal transmission between its signal input and signal output terminals;

and said equivalent static logic circuits connectable on a one-to-one basis in a, for example, contact-contact-coil circuit.

4,038,563

SYMMETRICAL INPUT NOR/NAND GATE CIRCUIT

Rainer Zuleeg, Huntington Beach, and Johannes K. Notthoff, Lomita, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 3, 1975, Ser. No. 619,308
Int. Cl.[2] H03K *19/08, 19/34, 19/36;* H01L *29/80*
U.S. Cl. 307—205 **5 Claims**

1. A nor/nand gate circuit comprising:

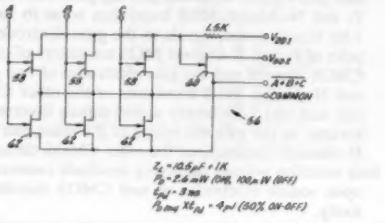
a plurality of first normally-off type of junction field effect transistors, each of said first transistors including a drain, gate and source;

a like plurality of second normally-off type of junction field effect transistors, each of said second transistors including a drain, gate and source;

a like plurality of individual input terminals;

a third normally-off type of junction field effect transistor, said third transistor including a drain, gate and source;

a common impedance means connecting said drains of said first transistors and said gate of said third transistor to a first supply voltage, said drain of said third transistor being connected to a second supply voltage, said drains of



said second transistors and said source of said third transistor being connected to a first output terminal, said sources of said first and second transistors being connected directly to a second output terminal; and

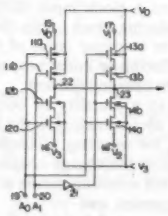
means connecting said gates of said first transistors and said gates of said second transistors directly to each other by pairs and each such pair directly to a corresponding one of said input terminals in an arrangement of said first and said second transistors which is symmetrical relative to said second output terminal.

4,038,564

MULTI-LEVEL VOLTAGE SELECTION CIRCUIT

Masayuki Hakata, Oume, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,172
Claims priority, application Japan, Feb. 20, 1975, 50-21306
Int. Cl.[2] H03K *19/08;* G02F *1/13;* G08B *5/36*
U.S. Cl. 307—205 **5 Claims**



1. A multi-level voltage selection circuit comprising:

two CMOS circuits, each including a pair of P-channel MOS transistors serially connected in source-to-drain fashion, and a pair of N-channel MOS transistors serially connected in source-to-drain fashion and having their gate electrodes connected to those of said P-channel MOS transistors, respectively, thereby forming two pairs of P- and N-channel MOS transistors, and the open drain electrode of said pair of N-channel MOS transistors being connected to that of said pair of P-channel MOS transistors;

an output terminal connected to the junctions between the P-channel MOS transistors and N-channel MOS transistors of said two CMOS circuits;

two gate control terminals, one of said gate control terminals being connected to the gate electrodes of one pair of P-

and N-channel MOS transistors of one of said CMOS circuits and to those of one pair of P- and N-channel MOS transistors of the other CMOS circuit, and the other of said gate control terminals being connected to the gate electrodes of the other pair of P- and N-channel MOS transistors of one of said CMOS circuits and to those of the other pair of P- and N-channel MOS transistors of the other CMOS circuit, said gate control terminals receiving 1-bit binary coded signals;

a logic circuit including one inverter and connected between said gate control terminals and the gate electrodes of said P- and N-channel MOS transistors so as to supply said 1-bit binary coded signals to the gate electrodes of both pairs of P- and N-channel MOS transistors of one of said CMOS circuits and the gate electrodes of one pair of P- and N-channel MOS transistors of the other CMOS circuit and said 1-bit binary coded signals inverted by said inverter to the gate electrodes of the other pair of P- and N-channel transistors of the other CMOS circuit; and

four selection voltage supplying terminals connected to the open source electrodes of said CMOS circuits, respectively.

4,038,565

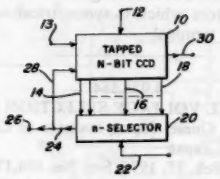
FREQUENCY DIVIDER USING A CHARGED COUPLED DEVICE

Ramasesha Bharat, 2905 Echo Hill Way, Orange, Calif. 92667

Filed Oct. 3, 1974, Ser. No. 511,861

Int. Cl.² H03K *21/36*

U.S. Cl. 307—225 C **8 Claims**



1. A frequency divider comprising:

a tapped N-bit charge coupled device;

means connected to a clock input of the charge coupled device for introducing clock pulses thereto;

means connected to a trigger input of the charge coupled device for introducing an initial propagating trigger pulse thereto to initiate charge injection;

means connected to a plurality of outputs of the charge coupled device, corresponding to the N bits of the charge coupled device, for selecting transmission of preselected tapped signals from the charge coupled device to an output terminal of the selecting means at which a frequency divided signal appears; and

feedback means connected between an output terminal of the selecting means and a feedback input terminal of the charge coupled device to provide trigger pulses subsequent to the initial trigger pulse to trigger subsequent charge injection.

4,038,566

MULTIPLIER CIRCUIT

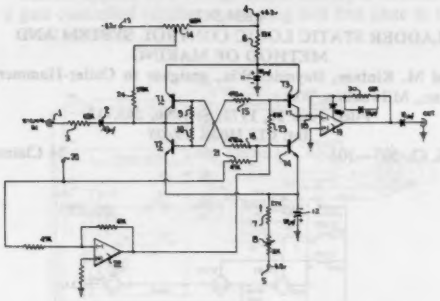
Ronald C. Evans, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,053

Int. Cl.² H03K *17/00*

U.S. Cl. 307—229 **10 Claims**

1. An electrical gain control system providing linear response over a wide range of gains including first bipolar diode circuit means for providing first output signals which are logarithmically related to an applied input signal, second bipolar circuit means connected in cascade with said first circuit means for providing a second output signal which is an antilogarithmic function of input signals applied to said second bipolar circuit means, and means for applying dc gain control voltage to said second bipolar circuit means, said second bipolar circuit means comprising a pair of series connected variable gain transistors of opposite conductivity types having an output terminal at the junction of said pair of series connected transistors.



4,038,567

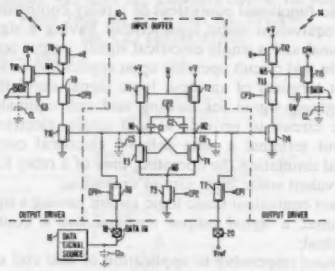
MEMORY INPUT SIGNAL BUFFER CIRCUIT

Scott Clarence Lewis, Essex Junction; Theodore Milton Redman, Williston; James Edward Rock, Milton, and Donald Lawrence Wilder, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,012

Int. Cl.² H03K *5/20, 5/18, 3/286, 3/353*

U.S. Cl. 307—362 **19 Claims**



1. An input signal buffering circuit comprising:

first and second input/output voltage nodes;

regenerative latch means coupled to said input/output voltage nodes for providing logical output signals on said input/output voltage nodes in response to the application of differential potentials to said nodes only on the condition that the potential of at least one of said voltage nodes exceeds a predetermined potential;

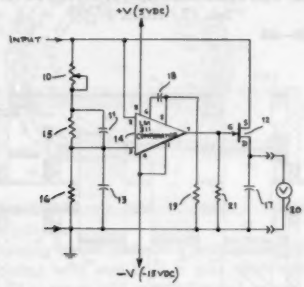
input signal source means for applying first and second input signal potentials to said first and second voltage nodes during a first clock period, the maximum magnitude of said first and second input signal potentials being insufficient to render said regenerative latch responsive; and

capacitive coupling means coupled to said voltage nodes for independently increasing the magnitude of the potentials applied to said first and second voltage nodes after the application of said signal potentials and during a second time period to cause said regenerative latch means to provide logical output signals.

4,038,568
PULSE PEAK SAMPLE AND HOLD CIRCUIT

Klaus D. May, and Anthony T. Nasuta, Jr., both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,573
Int. Cl.[2] H03K 5/20
U.S. Cl. 307—351 1 Claim



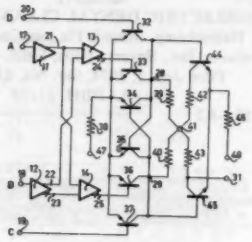
1. A pulse peak sample and hold circuit being comprised of an input integrator having a preselected time constant, said integrator including a variable resistor and capacitor, a switch field effect transistor normally off, a comparator having a preselected sensitivity, input pulses whose amplitude are to be determined being fed simultaneously and directly to said input integrator, said switch field effect transistor, and said comparator, said comparator also simultaneously receiving the output signal from said input integrator, the voltage across said comparator and across said resistor starting from a voltage peak and decaying to zero as said variable capacitor charges turning on said comparator until the voltage across said variable resistor becomes less than a preselected minimum voltage being said sensitivity of said comparator thus operating to provide an output gate pulse therefrom, a storage capacitor connected across the output of said switch field effect transistor, said output gate pulse being fed to said normally off switch field effect transistor turning it on allowing said storage capacitor to charge to the input pulse amplitude and pinching the field effect transistor off at the conclusion of the sample time as determined by said variable resistor, and a sensitive DC divider consisting of said variable resistor, first and second fixed resistors in series between a DC input and ground thus setting up a sensitive division between said variable, and said first and second fixed resistors always turning on said comparator.

4,038,569
BISTABLE CIRCUIT

Ferdinand Pool, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,772
Claims priority, application Netherlands, Sept. 2, 1974, 7411604
Int. Cl.[2] H03K 3/286
U.S. Cl. 307—289 9 Claims

1. In combination, a bistable circuit and a logic circuit, the bistable circuit comprising, a first set of transistors having their emitter electrodes interconnected and their collector electrodes interconnected, a second set of transistors having their emitter electrodes interconnected and their collector electrodes interconnected, means connecting first corresponding interconnected electrodes of said first and second sets of transistors to a first supply terminal via respective separate first and second resistors, means connecting second corresponding interconnected electrodes of said first and second sets of transistors to a second supply terminal via a common third resistor in a current source circuit which is common to both sets of transistors, said third resistor having a higher resistance value than said first and second resistors, one control electrode of each set of transistors being cross-wise coupled to said first corresponding interconnected electrodes of the other set, said logic circuit comprising at least two input terminals and two output terminals and internal logic means for generating a redundant logic signal, means connecting at least one further

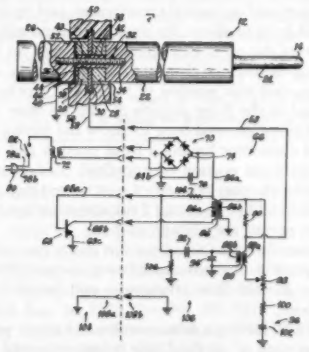


control electrode of each set of transistors to a respective output of said logic circuit, the redundancy of the logic circuit being testable under the control of co-existent signals applied to said further control electrodes whereby at least one transistor of each set of transistors can be made to conduct together so that said first and second resistors carry substantially equal currents in parallel.

4,038,570
ULTRASONIC PIEZOELECTRIC TRANSDUCER DRIVE CIRCUIT

Benton A. Durley, III, Rte. 45, Druce Lake, P.O. Box 304, Grayslake, Ill. 60030

Division of Ser. No. 525,487, Nov. 20, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,228
Int. Cl.[2] H01L 41/04
U.S. Cl. 310—8.1 7 Claims



1. A device for generating ultrasonic energy,
comprising a piezoelectric transducer including at least one piezoelectric element having a pair of electrodes on opposite sides of said element,
a solid-state amplifier having input and output connections,
a driver transformer having a primary winding connected to said output connections of said solid-state amplifier,
said driver transformer having a secondary winding connected to said electrodes of said piezoelectric transducer,
a feedback transformer having a secondary winding connected to said input connections of said solid-state amplifier,
said feedback transformer having a primary winding,
a phase shifting circuit connected between said electrodes and said primary winding of said feedback transformer,

and a resonating capacitor connected across said secondary winding of said feedback transformer,

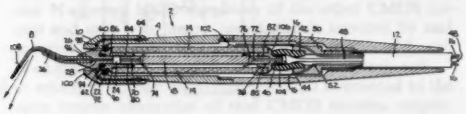
said resonating capacitor and said secondary winding of said feedback transformer forming a parallel resonant bandpass filter.

4,038,571

PIEZOELECTRIC DENTAL CLEANING DEVICE

Johann F. Hellenkamp, Miami, Fla., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Jan. 3, 1974, Ser. No. 430,504
Int. Cl.² H01L *41/04*
U.S. Cl. 310—8.2 **10 Claims**



1. A piezoelectric dental cleaning device comprising:

a. a hollow, tubular, piezoelectric crystal for converting electrical energy into mechanical vibrations, said crystal having a front portion and a rear portion;

b. electric wires electrically connected to said crystal to provide electrical energy to said crystal;

c. a tie rod axially disposed within said tubular crystal, said tie rod having a front portion and a rear portion, said tie rod having means to allow the passage of fluid from the rear portion of said tie rod to the front portion of said tie rod;

d. a acoustical transformer having a front portion and a rear portion, said rear portion of said acoustical transformer being attached to the front portion of said tie rod and to the front portion of said crystal, said acoustical transformer having an axial bore;

e. a tip base having a front portion and a rear portion, said rear portion of the tip base being connected to the front portion of said acoustical transformer, said tip base having an axial bore to allow the passage of fluid and flats on a portion of the outer circumference of said tip base;

f. a dental workpiece, having a front portion and a rear portion, said rear portion of the dental workpiece being mounted in the front portion of said tip base, said workpiece having an axial bore to allow the passage of fluid;

g. a fluid connector having a front portion and a rear portion, the front portion of said fluid connector being attached to the rear portion of said tie rod and to the rear portion of said crystal, said fluid connector having an axial bore to permit the passage of fluid;

h. a bumper having a front portion and a rear portion, said front portion of the bumper being connected to the rear portion of said fluid connector, said bumper having an axial bore;

i. a fluid tube having a front portion and a rear portion, said front portion of the fluid tube being connected to the rear portion of said bumper, said fluid tube having an axial bore to permit the passage of fluid;

j. a wire holder having a front portion and a rear portion, the front portion of said wire holder being attached to the rear portion of said bumper, said wire holder having an axial bore within which the fluid tube is disposed;

k. an outer case which houses th crystal, tie rod, acoustical transformer, tip base, fluid connector, bumper, wire holder, fluid tube and electric wires; and

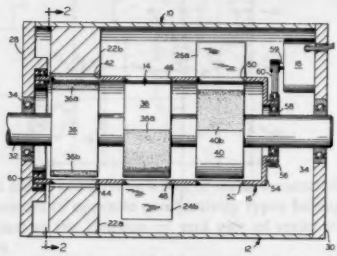
l. a front cap having a front portion and a rear portion and a substantially cylindrical configuration, the interior circumference of said cap being slightly larger than the outer circumference of the front portion of said outer case, said cap being rotatably positioned around the front portion of said outer case, said cap having interior flats at the front end of said cap, said flats being dimensioned to engage the flats on the exterior of said tip base to tighten or loosen or facilitate the removal of tip base and workpiece.

4,038,572

MAGNETIC CLUTCH DEVICE

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry Inc., Somersville, Conn.

Continuation-in-part of Ser. No. 565,747, April 7, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,933
Int. Cl.² H02K *37/00*
U.S. Cl. 310—46 **8 Claims**



1. A magnetic motor comprising:

a. a stationary housing having a generally cylindrical inner configuration including a pair of end bells supported within said housing;

b. stationary field means supported within said housing;

c. an output shaft supported by said pair of end bells for rotation relative thereto and in response to the application thereto of magnetic forces;

d. rotatable field means supported on said output shaft for rotation therewith, said rotatable field means being secured to said output shaft at a position along the length of said output shaft so that said rotatable field means and said stationary field means are in axial alignment;

e. control means supported within said housing for rotation relative thereto, said control means being rotatable independent of the rotation of said output shaft, said control means being being interposed between said stationary field means and said rotatable field means and having port means formed therein alignable with said stationary field means and said rotatable field means, said control means being rotatable between a first position wherein said port means is aligned with said stationary field means and said rotatable field means so as to enable maximum magnetic attraction to exist therebetween operable for imparting rotation to said output shaft and a second position wherein said port means is nonaligned with said stationary field means and said rotatable field means; and

f. drive means supported within said housing and operatively connected to said control means for rotating said control means between said first and second positions thereof.

4,038,573

COIL TERMINATING MEANS

Michael J. Hillyer, Mechanicsburg, and Victor J. Madison, Carlisle, both of Pa., assignors to General Signal Corporation, Rochester, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,918
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 **14 Claims**

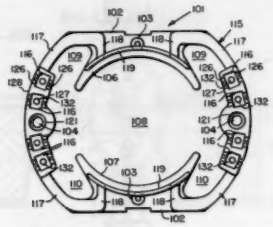
1. An assembly comprising in combination:

a. a magnetizable stator assembly for a fractional horsepower motor made of a plurality of laminated elements having congruent outlines, stacked together and configured to include a central opening to accommodate a rotor;

b. a preformed and separable terminal board configured to lie within the outline of said congruent elements without

infringing on the area of said central opening and overlaying the outermost of said stack of laminated elements;

c. said terminal board including a first retaining means, a wing section and a facility for accommodating a plurality of terminals;



d. said stator assembly having at least one hole in the body thereof; and wherein

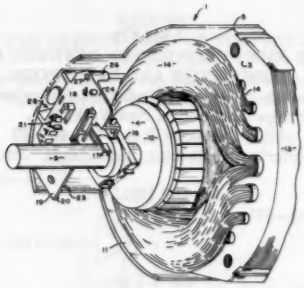
e. said first retaining means includes a boss on said terminal board for mating with said hole in said stator assembly with a press fit to retain said terminal board on said stator assembly in said overlaying relationship.

4,038,574

MOTOR LEAD GUIDE AND LEAD WIRE ATTACHING MEANS

William D. Crow, and Thomas V. Ottersbach, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 18, 1975, Ser. No. 587,971
Int. Cl.² H02K *11/00*
U.S. Cl. 310—71 **9 Claims**



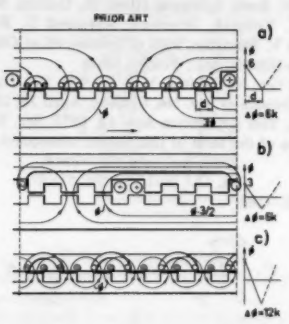
1. In an electric motor having a shell, end shields at opposite ends of said shell, said shell and end shields defining a chamber, said shell having an opening in it communicating with said chamber, said opening adapted to receive external lead wires for connecting said motor to a source of electrical energy, a stator assembly mounted in said chamber, said stator assembly including a winding having motor lead wires attached thereto, a shaft, said shaft being rotatably supported along said end shields, a rotor assembly mounted to said shaft and rotatable therewith, and a terminal board mounted to said motor, said terminal board being adapted to interconnect the external lead wires to various ones of said motor lead wires, the improvement which comprises means for guiding the external lead wires inserted through said opening in said shell from said opening to said terminal board, said guide means including a first wall defining ramp means extending between an area near said opening and said terminal board for directing said external lead wires to a connection area of said terminal board, said first wall having a rectangular shape in plan, said first wall further being offset with respect to a horizontal axis, and three side walls positioned along the perimetrical edges of said first wall.

4,038,575

MULTI-PHASE GENERATOR

Knut Assar Nordebo, 28 Ringvagen, Haparanda, Sweden (S-953 00)

Filed Mar. 18, 1974, Ser. No. 452,448
Claims priority, application Sweden, Mar. 19, 1973, 7303768
Int. Cl.² H02K *3/00*
U.S. Cl. 310—179 **1 Claim**



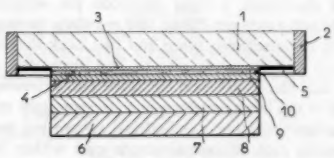
1. A multi-phase induction generator including in combination, a rotor having a plurality of equally spaced poles but no windings thereon, a stator having a different number of equally spaced poles each provided with a single centrally disposed slot, said rotor and stator being mounted concentrically for relative rotation and with an air gap therebetween, a direct current energizable exciting winding mounted on said stator and encompassing each said stator pole for producing magnetic flux of the opposite sense in adjacent stator poles, and a multi-phase alternating current output winding mounted on said stator with the phase windings located respectively in the centrally disposed slots of adjacent stator poles thereby to achieve a mutual displacement of half a pole pitch between said exciting winding and said multi-phase output winding, said multi-phase output winding producing a multi-phase output voltage between beginning and end terminals of each stator phase winding, the number of stator poles being equal to $m \cdot p$, the number of rotor poles being equal to $m(p \pm 1)$, m being an integer factor 1, 2, 3...., and p being an even integer 2, 4, 6 ... .

4,038,576

PHOTOCATHODE SUPPORT OF CORUNDUM WITH LAYER OF BARIUM BOROALUMINATE OR CALCIUM BOROALUMINATE GLASS

Jean Philippe Hallais, Ablon; Michel Jean-Claude Monnier, and Jean-Claude Richard, both of Montgeron, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,547
Claims priority, application France, Feb. 4, 1975, 75.03429
Int. Cl.² H01J *39/02, 31/38*
U.S. Cl. 313—101 **3 Claims**



1. In an electron tube having a photocathode for the near infra-red of the III–V type of the p-conductivity type, a window consisting of an oxidic monocrystalline body of corundum on which the photocathode is secured by a glass which is pervious in the relevant wavelength range and is chemically

resistnat, said glass being selected from barium boroaluminate and calcium boroaluminate having the composition 15–35% CaO, or BaO, 45–70% B_2O_3 and 10–20% Al_2O_3.

4,038,577

GAS DISCHARGE DISPLAY DEVICE HAVING OFFSET ELECTRODES

Wolfgang W. Bode, Sylvania; Glenn H. Dunlap, Maumee; Anthony M. Kobylak, Rossford; Raymond S. Richards, and Lawrence V. Pfaender, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 86,094, Nov. 2, 1970, Pat. No. 3,927,342, which is a division of Ser. No. 819,641, April 28, 1969, Pat. No. 3,602,754. This application Apr. 12, 1973, Ser. No. 350,425
The portion of the term of this patent subsequent to Aug. 31, 1988, has been disclaimed.
Int. Cl.[2] H01J *61/04, 61/30*
U.S. Cl. 313—188 2 Claims

1. In a gaseous discharge information display/memory panel in which an ionizable gaseous medium associated with a pair of transversely related conductor arrays is excited at least at one selected site thereof by applied electrical potentials between at least one conductor in one of said arrays and at least one conductor in the other of said arrays, the gas adjacent the crossing point of each pair of said conductors locating a selected site in the gaseous medium, respectively, and said arrays and conductors being electrically insulated from one another and the gaseous medium, the improvement

wherein each conductor in the conductor array on the viewer's side of said panel is a single conductor physically offset to one side of the respective gas sites in the gaseous medium located thereby so as to not block light emission from the sites so located in the direction of a viewer of information displayed in said panel,

and wherein said gaseous medium is confined in an elongated capillary tube and said at least one conductor is parallel to the longitudinal axis of said capillary tube.

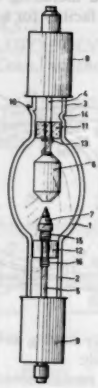
4,038,578

SHORT-ARC DISCHARGE LAMP WITH ELECTRODE SUPPORT STRUCTURE

Petrus Johannes Mathijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,058
Claims priority, application Netherlands, June 5, 1975, 7506655
Int. Cl.[2] H01J *61/06, 61/16, 61/30*
U.S. Cl. 313—217 7 Claims

1. A short-arc discharge lamp comprising: an envelope, two opposed electrodes, a rigid electrode pin supporting each electrode and a rare gas filling, said envelope having a portion enclosing the discharge space and two neck-shaped portions via which said electrode pins to said electrodes extends to support said electrodes, said electrode pins extending through the wall of the lamp envelope in a vacuum-tight manner said lamp further including a cylindrical supporting member disposed about each of said electrode pins within one of said neck-shaped portions said cylindrical supporting member having an inside diameter greater then said electrode pin and an outside diameter less than the inside diameter of said neck-shaped portions in which said supporting member is disposed when said lamp is not operating and means to fix the supporting member against axial displacement with respect to the electrode pin about which said supporting member is disposed, the difference in the inside diameter of said supporting member



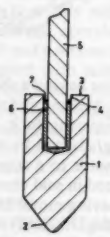
and said neck-shaped portion allowing for differential expansion with changes in temperature.

4,038,579

SOLDER JOINT CONNECTION BETWEEN LEAD-IN CONDUCTOR AND ELECTRODE

Tjepke Hendrik Ekkelboom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,587
Claims priority, application Netherlands, Jan. 11, 1973, 7300381
Int. Cl.[2] H01J *5/50*
U.S. Cl. 313—331 4 Claims



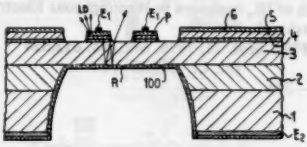
1. An electrode intended for a high-pressure gas discharge lamp which primarily consists of at least one of the metals selected from the group consisting of tungsten and tantalum and which is secured by means of a soldered joint to a current supply conductor mainly consisting of at least one of the metals selected from the group which consists of tungsten, molybdenum and tantalum, said metals having a melting point greater than 2000° C, said joint containing zirconium, and at least the external surface layer of the soldered joint consisting of zirconium nitride.

4,038,580

ELECTRO-LUMINESCENT DIODE

Francis Porret, Hauterive, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Aug. 26, 1975, Ser. No. 607,922
Claims priority, application Switzerland, Sept. 5, 1974, 12082/74
Int. Cl.² H01J 1/02
U.S. Cl. 313—498 8 Claims



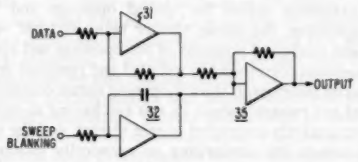
1. An electro-luminescent diode, comprising a body having a luminous surface which is defined by a thinned portion of said body, said surface including zones with light emitting junctions, said zones occupying only a portion of said thinned portion, the composition of said thinned portion being varied such that a lower absorption of the emitted light is exhibited outside said zones than within said zones, and said thinned portion including reflector means on the back surface of said thinned portion to enable recovery, by multiple reflection, of the light emitted within the diode to improve the luminous efficiency thereof.

4,038,581

CIRCUIT FOR ELIMINATION OF SURFACE CHARGE INTEGRATION

Denis Peter Dorsey, Levittown, Pa., and William E. Rodda, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,326
Int. Cl.² H01J 29/52, 29/78
U.S. Cl. 315—13 ST 1 Claim



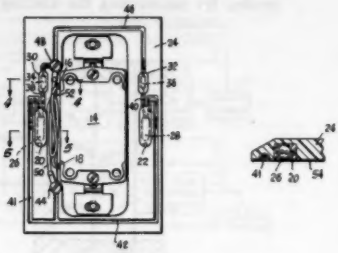
1. The combination comprising:
surface charge storage means for recording data by charging a surface;
charge deposit means for charging said surface in response to signals to be stored;
sweep means for radially positioning said charge deposit means from the center of the surface in response to a sweep signal; and
control means for varying charge intensity as a function of the distance of the charge deposit means from the center of the surface,
said control means comprising integrator means responsive to a blanking signal preceding each sweep signal for producing an output signal and adder means responsive to data signals and to said output signal.

4,038,582

INTERNALLY ILLUMINATED SWITCH PLATE

Elwood R. Horwinski, Cheshire, Conn., assignor to Product Concepts, Inc., Middlebury, Conn.

Filed Aug. 28, 1975, Ser. No. 608,742
Int. Cl.² F21V 33/00; H05B 37/00
U.S. Cl. 315—129 1 Claim



1. An illuminated switch plate for wall fixtures and the like, comprising in combination:
a. a flat slab adapted to overlie and be secured to the fixture so as to constitute a wall plate thereof,
b. said slab having a shallow recess disposed behind the front surface thereof, and being constituted of a material which conducts light,
c. a neon glow lamp disposed in said recess,
d. resistive circuit means carried by the slab, disposed behind its front surface and connected with said glow lamp, and
e. electrical leads connected with said resistive circuit means and adapted for attachment to the terminals of a switch over which the slab is disposed, whereby the lamp will become illuminated by the voltage appearing across the switch terminals when the switch is open, thus providing a visual indication of the condition of the switch,
f. said slab having an additional recess,
g. said resistive circuit means comprising a resistor disposed in said additional recess and connected in series with said lamp,
h. means physically securing said resistor in said additional recess,
i. said slab having grooves on its rear surface,
j. said electrical leads comprising conductive strips of conductive paint disposed in said grooves, connected with said resistor and said lamp,
k. a pair of electrical contacts carried by said slab, and being electrically connected with said conductive strips,
l. said electrical leads further comprising a pair of flexible wires connected respectively to said contacts and adapted to be connected to the terminals of the switch,
m. said lamp, said resistor and said conductive paint all lying substantially entirely within the confines of the slab whereby the likelihood of damage to the lamp and resistor due to inadvertent jarring, and the likelihood of breakage or shortcircuiting of their leads are substantially reduced.

4,038,583

APPARATUS FOR THE GENERATION OF NEGATIVE OR POSITIVE ATMOSPHERIC IONS

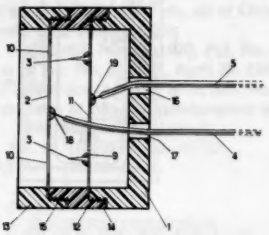
Jacques Leon Georges Breton, 9, avenue de Gradignan, Pessac, France

Filed Oct. 28, 1975, Ser. No. 625,901
Claims priority, application France, May 9, 1974, 74.16732
Int. Cl.² H05F 3/06
U.S. Cl. 361—230 9 Claims

1. Apparatus for generating negative or positive atmospheric ions, within a confined or free atmospheric space, with a high and adjustable yield and a large distance penetration and no appreciable ozone production, comprising:
an ionizing electrode comprising at least one ionizing point;

an acceleration electrode comprising a conductive plate spaced outwardly from the tip of the ionizing electrode point and having an acceleration and focussing aperture with a diameter substantially larger than the maximum diameter of the ionizing point and aligned with the axis of the ionizing point;

and high voltage supply means, connected to the two electrodes, for maintaining the ionizing electrode at a high



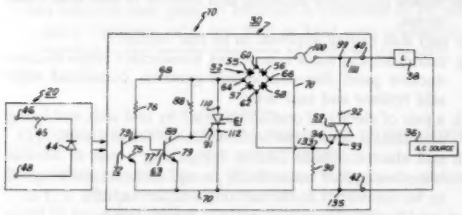
voltage of given polarity and for maintaining the acceleration electrode at a substantially lower voltage of the same polarity, so that the configurations of the equipotential surfaces between the two electrodes and externally of the acceleration electrode are only a function of the ratio of the voltage of the two electrodes and afford an electronic lens having an axis coincident with the axis of the ionizing point.

4,038,584

PROTECTIVE ARRANGEMENT FOR DEPENDENT SWITCHING CIRCUITS

Edward Tarchalski, Lawrenceville, and John C. Wilkinson, Hightstown, both of N.J., assignors to Heinemann Electric Company, Trenton, N.J.

Filed June 15, 1976, Ser. No. 696,211
Int. Cl.² H02H 7/20
U.S. Cl. 361—104 **12 Claims**



1. An alternating current solid state relay circuit comprising

a pair of load terminals connectable in series with a load and in series with an alternating current power source,

a triac having first and second main terminals and a gate terminal,

means for connecting said triac main terminals to said load terminals and thereby to the alternating current to be controlled,

a full wave rectifier having alternating current input terminals and direct current output terminals,

said full wave rectifier input terminals being connected between said first main terminal of said triac and said gate terminal of said triac,

a fusible resistor connected between said first main terminal of said triac and one of the input terminals of said full wave rectifier,

a silicon controlled rectifier connected between said direct current terminals of said full wave rectifier, and

an optically controlled means responsive to a control signal for rendering said silicon controlled rectifier conductive and thereby also triggering said triac into conduction,

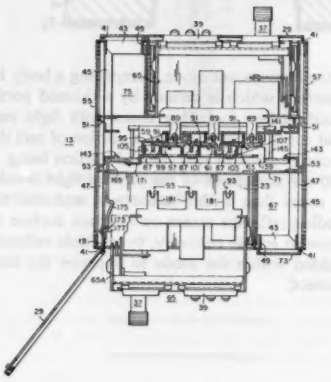
whereby said fusible resistor limits the current to said triac and also opens the circuit when it fuses should said triac fail open.

4,038,585

INSULATING SHUTTER MECHANISM FOR BUS BARS

Jerome C. Wolski, Downers Grove, and Neal E. Rowe, Oak Forest, both of Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1975, Ser. No. 612,524
Int. Cl.² H02B 1/14
U.S. Cl. 361—334 **3 Claims**



1. A control center for distributing electric power from a power supply source to power-consuming devices, comprising a cabinet having a frame providing a compartment on the front side of the cabinet, a plurality of vertical, horizontally spaced, bus bars in said cabinet, a barrier of electrically insulative material covering the bus bars, the barrier having spaced contact-receiving openings for each bus bar so that terminal contacts of a circuit interrupter may be inserted into the openings when a circuit interrupter is placed in the cabinet, shutter means for closing the openings when the circuit interrupter is withdrawn from the bus bars, said means including a planar shutter extending across the spaced openings and having spaced apertures; the planar shutter being slidable between aligned and unaligned positions of the openings and apertures which positions correspond to installed and removed positions of the circuit interrupter, shutter-opening means comprising an elongated rod rotatable about its axis and having an outturned portion operatively connected to said shutter, and the shutter-opening means also comprising an outwardly inclined cam segment extending into the path of travel of the circuit interrupter so that the rod is rotated to move the shutter to the aligned position when the circuit interrupter is installed.

4,038,586

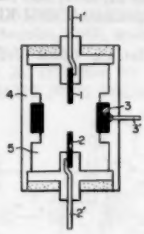
COULOMB MEMORY ELEMENT

Satoshi Sekido, Kyoto, and Tomohiko Arita, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 397,330, Sept. 17, 1973, abandoned.
This application May 20, 1975, Ser. No. 579,240
Claims priority, application Japan, Sept. 20, 1972, 47-94766; Sept. 20, 1972, 47-94767; Mar. 1, 1973, 48-24889
Int. Cl.² H01G 9/18
U.S. Cl. 361—435 **2 Claims**

1. A coulomb memory element comprising an electrolyte consisting of an aqueous solution selected from the group consisting of lead silicofluoride ($PbSiF_6$), lead borofluoride

($Pb(BF_4)_2$) and mixtures thereof, having added thereto a member selected from the group consisting of lithium silicofluoride and lithium borofluoride; at least one inactive electrode consisting essentially of tungsten plated with gold; and at least one



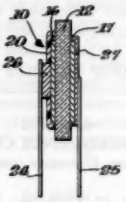
active electrode consisting essentially of lead, said electrolyte being charged between said inactive and active electrodes and said active electrode being dissolved or deposited according to Faraday's law.

4,038,587

CERAMIC DISC CAPACITOR AND METHOD OF MAKING THE SAME

Kenneth J. Kaliebe, Cedarburg, Wis., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 21, 1975, Ser. No. 606,699
Int. Cl.[2] H01G *4/06*
U.S. Cl. 361—321 **8 Claims**



1. A capacitor comprising a dielectric body having opposed surfaces, a first electrode on one of said surfaces, a second electrode on the other of said surfaces in substantial capacitive overlap with said first electrode, a coating of abradable hard insulative solder-resistant material overlying a first portion of said first electrode, a second portion of said first electrode being uncoated by said coating, terminal members attached to said second portion and to said second electrode by solder layers which physically contact and adhere to said second portion and said second electrode, a part of said one surface of the dielectric body overlying said second electrode being free of said coating and said first electrode, said first portion and said part being free of solder.

4,038,588

PRECISION AMPLITUDE CONTROL SYSTEM FOR A HIGH Q TORSION PENDULUM

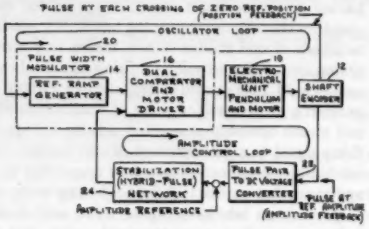
Martin G. Woolfson, Baltimore, and Robert H. Plath, Linthicum Heights, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1976, Ser. No. 655,031
Int. Cl.[2] B64C *17/02*
U.S. Cl. 318—648 **6 Claims**

1. An amplitude control apparatus for a high Q torsion pendulum comprising in combination:

an oscillating means providing a pendulu.n amplitude, said oscillating means utilizing position feedback signals to maintain pendulum amplitude, said position feedback signals occuring each time said oscillating means passes though the zero reference position, and

an amplitude control means connected to said oscillating means to derive an amplitude signal for each swing of said oscillating means, said amplitude control means comprising said amplitude signal with an amplitude reference voltage, said amplitude signals occurring in pulse pairs,



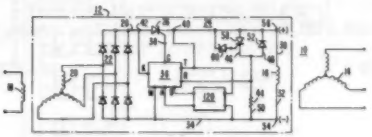
said pulse pairs being transformed to a DC level which is compared with said amplitude reference voltage to provide an amplitude error signal, said amplitude error signal being integrated and transformed into an error pulse having a pulse width representative of said amplitude error signal, said error pulse being applied to said oscillating means to maintain a constant preset pendulum amplitude.

4,038,589

CONTROLLED POST-SYNCHRONIZING ON BRUSHLESS SYNCHRONOUS MOTORS

Carl J. Heyne, Allison Park; Richard Cooper, Jr., Monroeville, and Gurney L. Godwin, ittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,002
Int. Cl.[2] H02P *1/50*
U.S. Cl. 318—174 **3 Claims**



1. A synchronous dynamoelectric machine comprising: a rotary field winding, an alternating current exciter armature rotatable with said field winding, rectifier means connected to said exciter armature to supply direct current excitation to said field winding, a discharge circuit including a resistor and field discharge switching means connected across said field winding for discharging current induced in said field winding during subsynchronous operation, an exciter switch connected in an excitation circuit between said rectifier means and said field winding for applying direct current excitation from said rectifier means to said field winding, and an excitation control system operably connected to control the actuation of said exciter switch,

said excitation control system comprising a pre-synchronizing circuit responsive to the slip frequency of voltage induced in said field winding for actuating said exciter switch to conduct synchronizing excitation current to said field winding substantially at a predetermined slip voltage frequency, a post-synchronizing firing circuit responsive to a voltage of predetermined magnitude and polarity impressed across said exciter switch for actuating said exciter switch upon the condition that said field winding is synchronized before said exciter switch is actuated by said pre-synchronizing circuit, and circuit means for inhibiting

the operation of said post-synchronizing circuit during subsynchronous operation,

said inhibiting circuit means being responsive to a voltage of predetermined magnitude and polarity developed across said field winding for preventing actuation of said exciter switch by said post-synchronizing firing circuit during subsynchronous operation, and

said post-synchronizing circuit including a timing circuit having a resistor and a capacitor connected to be energized by the voltage appearing across the anode-cathode terminals of said exciter switch, means responsive to said timing circuit for providing a firing signal when the voltage of said post-synchronizing timing circuit capacitor exceeds a predetermined value of predetermined polarity, and means operably connected thereto for applying said firing signal to a gate terminal of said exciter switch, said inhibiting circuit including means responsive to said voltage appearing across said field winding being connected to provide an inhibiting signal when said field winding voltage exceeds a predetermined value, and discharge means responsive to said inhibiting signal connected to discharge said post-synchronizing timing capacitor during each slip cycle of subsynchronous operation.

4,038,590

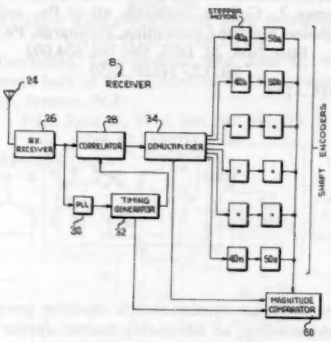
PULSE CODE MODULATION RADIO CONTROL SYSTEM

Dennis J. Knowlton, 1915 Park, Laramie, Wyo. 82070

Filed Jan. 3, 1975, Ser. No. 538,338

Int. Cl.[2] G05B *11/32*

U.S. Cl. 318—562 **7 Claims**



1. A pulse code modulation radio control system particularly suited for the remote control of model aircraft which comprises:

shaft encoder means for producing digital output signals indicative of the position of a plurality of control members;

means responsive to said digital output signal for modulating the phase of a subcarrier signal to shift the phase of said subcarrier signal in response to digital signals of one type by 180°;

means for transmitting an r-f carrier signal modulated by said phase-modulated subcarrier signal;

receiver means for detecting said phase-modulated subcarrier signal from said r-f carrier signal;

a phase-locked loop circuit connected to receive the output from said receiver means; and

correlation detection means for receiving the output from said receiver means and the output from said phase-locked loop circuit and for producing an output digital pulse train corresponding to said digital output signals.

4,038,591

AUTOMATIC MACHINE TOOL AND METHOD OF OPERATION

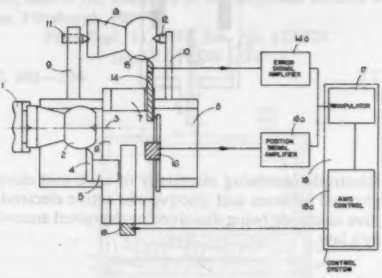
Julius Harman, Baginton, England, assignor to Alfred Herbert Limited, Coventry, England

Filed July 21, 1975, Ser. No. 597,558

Claims priority, application United Kingdom, July 26, 1974, 33026/74

Int. Cl.[2] G05B *17/36*

U.S. Cl. 318—578 **14 Claims**



1. An automatic machining process for the production of a component according to a predetermined programme, comprising moving a member automatically through a machining cycle acording to said programme and simultaneously causing a monitoring device to be correspondingly traversed in a path determined by the programme over a component previously machined according to the programme, so as to sense deviations from the expected component shape appearing in the previously machined component, and using said deviations to effect corresponding corrective tool off-sets in one of the aforesaid and a subsequent machining cycle.

4,038,592

VOLTAGE AND FREQUENCY CONTROL CIRCUIT

Franz Stummer, Noham, Germany, assignor to Alberto Kling, Germany

Filed Sept. 17, 1975, Ser. No. 614,235

Claims priority, application Germany, July 30, 1975, 2534090

Int. Cl.[2] H02M *5/257*

U.S. Cl. 363—165 **15 Claims**

1. A voltage and frequency control circuit for converting an input ac signal with inconstant frequency and amplitude into an output ac signal with constant amplitude and a constant nominal frequency which is lower than the lowest occurring frequency of the input ac signal, said control circuit including serially connected switching units comprising:

amplitude control circuit means for converting an ac signal with inconstant amplitude to an ac signal with constant amplitude, said amplitude control circuit means including a variable transformer and automatic control means for sensing the amplitude of the output signal of said transformer and varying the transformer to maintain said amplitude constant;

rectifier circuit means in communication with said amplitude control circuit means for converting an ac signal with inconstant frequency to alternate positive and negative sets of half-waves of said inconstant frequency signal, including an ac voltage source connected to said rectifier circuit means to provide an ac control signal having a constant nominal frequency such that a positive set of said half-waves is generated by said rectifier means during positive polarity of said control signal and a negative set of said half-waves is generated by said rectifier means during negative polarity of said control means; and

filter circuit means in communication with the output of said rectifier circuit means for smoothing and shaping the positive and negative sets of half-waves into a sinusoidal

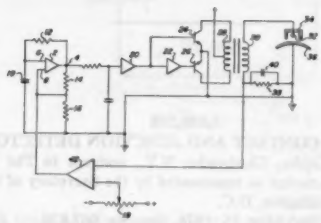
signal having the frequency of said ac voltage source to form said output ac signal.

4,038,593

REGULATED HIGH VOLTAGE AC POWER SUPPLY WITH REGULATED D.C. BIAS CURRENT

Halsey P. Quinn, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1975, Ser. No. 617,112
Int. Cl.[2] H01T *19/00*; H02M *7/515*
U.S. Cl. 323—4 8 Claims



1. An a.c. and d.c. power supply for driving a non-linear load in which current over the operating voltage range increases faster or slower than applied voltages comprising:

generating means for generating non-symmetrical a.c. voltage waveshape,

a transformer for coupling said a.c. waveshape from said generating means to said load such that the sum of all instantaneous positive and negative a.c. voltages at said load will be approximately zero,

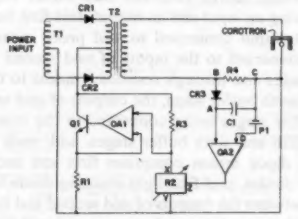
d.c. feedback means for sensing the d.c. current at said load produced by the application of said non-symmetrical a.c. voltage to said non-linear load, and for producing and coupling to said generating means a correction signal to vary the symmetry of said a.c. waveshape to regulate said load d.c. current to a pre-determined level.

4,038,594

DISTORTIONLESS SINE WAVE AMPLIFICATION

Halsey P. Quinn, Rancho Palos Verdes, and Donald B. Levinson, Beverly Hills, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1975, Ser. No. 617,111
Int. Cl.[2] G05F *1/44*
U.S. Cl. 323—4 8 Claims



1. A power supply for generating true sine wave signals comprising:

means for supplying AC current to a load,

means coupled to said supplying means for monitoring the amount of current flowing through said load,

feedback circuit means coupled to said monitoring means and said supplying means to allow an adjustment of said AC current to said load, said feedback circuit means including variable resistance means for effecting a linear current change in said load to effect said generation of true sine wave signals,

said feedback circuit means also including first circuit means coupled between said variable resistance means and said supplying means for adjusting the input supply current to said supplying means, said first circuit means and said variable resistance means comprising a resistance dividing network so that when said variable resistance means is varied the current supplied to said supplying means is varied accordingly,

said first circuit means also including an operational amplifier,

a pass transistor whose base element is connected to the output of said operational amplifier and whose emitter and collector elements are in series with the supply current to said supplying means,

a first resistor connected to said emitter element to complete said series connection to said supplying means, said first resistor-transistor emitter element junction also connected to one input of said operational amplifier,

a second resistor connected to the collector of said transistor and the other input of said operational amplifier, this input junction also connected to said variable resistance means, and

said operational amplifier, upon change of resistance of said variable resistance means, will cause the ratio of the voltage across said first resistor and said variable resistance means to be constant, and

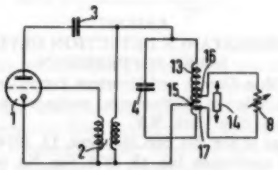
said feedback circuit means also including second circuit means coupled between said monitoring means and said variable resistance means for adjusting the signal applied to said variable resistance means in response to the change in current through said monitoring means.

4,038,595

SELF-EXITED HIGH-FREQUENCY GENERATOR

Herbert Wiichter, and Hans-Joachim Gronemann, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1975, Ser. No. 553,111
Claims priority, application Germany, Mar. 20, 1974, 2413508
Int. Cl.[2] H02P *13/10*; G05F *7/00*
U.S. Cl. 323—45 1 Claim



1. In a self excited high frequency generator of the type including an oscillator tube and a parallel resonant circuit and including a high frequency current transformer consisting of a single transformer winding and a axially movable core of highly permeable material of a size which is considerably shorter than the length of the winding and which is arranged wholly inside of the transformer winding, with an inductor coupled to the transformer winding as a load, the improvement comprising:

a. the load being connected directly between at least one turn of the transformer winding with terminals attached thereto near the end of said winding;

b. the oscillator tube being coupled to the transformer winding in the area of said load terminals using a rigidly connected intermediate tap; and

c. said core being disposed for axial movement only in the vicinity of the intermediate tap of said oscillator tube whereby movement of said core is restricted within the

confines of the transformer winding and permits matching the oscillator tube to the load without changing the overall inductance of the transformer coil and thus without changing frequency.

4,038,596

METHOD AND APPARATUS FOR AUTHENTICATING A RECORD MEDIUM CONSISTING OF APPLYING TWO DIFFERENT STRENGTH MAGNETIZING FIELDS AND MONITORING THE REMANENT FIELDS

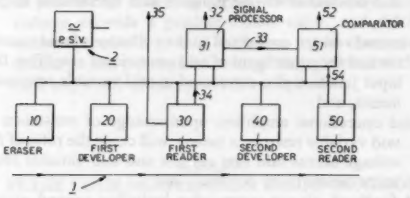
Cyril Arthur Lee, Maidenhead, England, assignor to E M I Limited, Hayes, England

Filed July 2, 1975, Ser. No. 592,669

Claims priority, application United Kingdom, July 4, 1974, 29663/74

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—34 R **11 Claims**



1. A system for examining a record medium expected to include a magnetic material storage layer exhibiting an inherent pattern of magnetic remanence difference between a part of the layer and another part of the layer when both parts are subjected to a uniform magnetising field including

means for applying to the layer in turn at least two different strength magnetising fields along the same direction,

means for measuring the relative remanent magnetisation in said part and said another part for each said magnetising field, and

means responsive to the measurements to assess the authenticity status of the medium, the relative remanent magnetisations differing for said different strength magnetising fields for an authentic medium.

4,038,597

MAGNETORESISTANCE DETECTION DEVICE HAVING NOISE SUPPRESSION

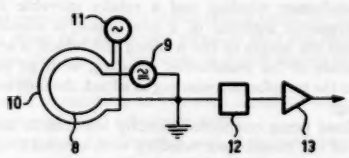
Frederik Willem Gorter, and Henricus Petrus Johannes Wijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 505,243, Sept. 12, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,560

Claims priority, application Netherlands, Sept. 22, 1973, 7313096

Int. Cl.[2] G01R *33/02*

U.S. Cl. 324—46 **3 Claims**



1. A magneto-resistive detection device for determining the presence or absence of a single-wall magnetic domain at a position in a sheet of magnetic material in which stable single-wall magnetic domains can be moved, comprising which stable single-wall magnetic domains can be moved, comprising a loop-shaped element of magneto-resistive material on said sheet of magnetic material disposed so that the resistance thereof varies when a single-wall domain is present at said position, means to energize said sensing element with an a-c current signal, and means to detect a signal produced by said loop-shaped sensing element when a single-wall magnetic domain is present at said position, said detection means including a selective amplifier tuned to one of the second, third, and fifth harmonics of said signal, said harmonics being interference free.

4,038,598

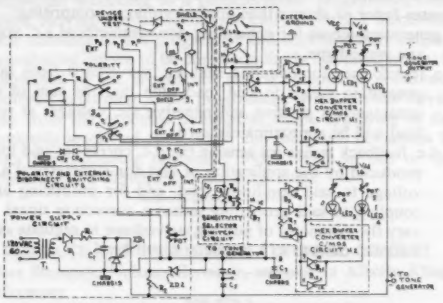
PROBE CONTACT AND JUNCTION DETECTOR

Vincent C. Kapfer, Chadwicks, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 16, 1976, Ser. No. 667,820

Int. Cl.[2] G01R *31/02, 19/16*

U.S. Cl. 324—72.5 **7 Claims**



1. A probe contact and junction detector for microcircuit analysis comprising

a probe means,

first and second complementary MOS hex buffer converter logic circuits connected to receive the output of said probe means,

each said hex buffer converter logic circuit comprising first, second, third, fourth, fifth and sixth buffer stages, each stage having an input and an output, said first buffer stage having its input connected to said probe means and its output connected to the inputs of said second and third buffer stages and through resistance means to the output of said fourth buffer stage, the outputs of said second and third buffer stages being connected to the inputs of said fourth, fifth and sixth buffer stages, and, each said light emitting diode means comprises first and second light emitting diodes, said first light emitting diode being connected between the outputs of said second and third buffer stages and the power supply means, and said second light emitting diode being connected between the outputs of said fifth and sixth buffer stages and the power supply means;

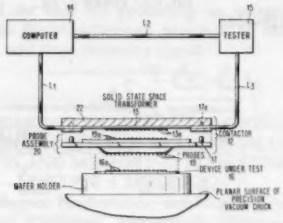
a light emitting diode means connected to receive and respond to **0** and **1** level logic signals generated by each hex buffer converter logic circuit, and

power supply means connected to provide a voltage source for said light emitting diode means and for said hex buffer converter logic circuits.

4,038,599
HIGH DENSITY WAFER CONTACTING AND TEST SYSTEM

Ronald Bove, and Eric M. Hubacher, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,514
Int. Cl.[2] G01R 31/02, 31/26
U.S. Cl. 324—158 F 5 Claims



1. A space transformer for use in an electronic test system for testing micro-miniature electronic devices, said space transformer comprising:

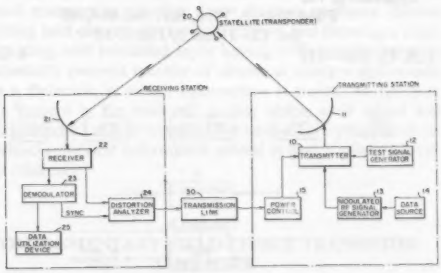
a monolithic silicon structure;

said silicon structure containing, a first binary decoder circuit adapted to receive a first set of m binary inputs and provide a first set of 2^m binary outputs, a second binary decoder circuit adapted to receive a second set of m binary inputs and provide a second set of 2^m binary outputs, a third binary decoder circuit adapted to receive a third set of m binary inputs and provide a third set of 2^m binary outputs, a fourth binary decoder circuit adapted to receive a fourth set of m binary inputs and provide a fourth set of 2^m binary outputs, where m may be any integer number, a plurality of logic circuits selectively connected to said outputs of said first, second, third and fourth binary decoders, an array of exposed conductive pads connected to said plurality of logic circuits.

4,038,600
POWER CONTROL ON SATELLITE UPLINKS

Leslie D. Thomas, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 17, 1976, Ser. No. 658,932
Int. Cl.[2] H04B 7/00
U.S. Cl. 325—4 9 Claims



1. A system for controlling the power level of the output signal of a transmitter which communicates with a receiver via a transponder such that the power level of the signal arriving at the input of said transponder has the desired level, comprising in combination:

transmitter means for generating and transmitting a signal comprising first and second carriers;

transponder means for receiving said signal and for retransmitting selected intermodulation products produced by said transponder;

receiving means for receiving said selected intermodulation products;

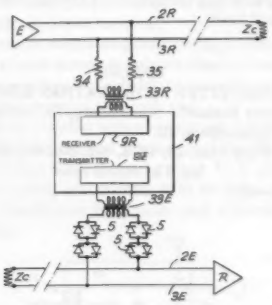
distortion analyzer means coupled to said receiving means for analyzing said selected intermodulation products to produce a control signal related to the magnitude of said signal at the input of said transponder; and

power control means responsive to said control signal for adjusting said transmitter so that said signal has the desired level as measured at the input of said transponder.

4,038,601
DEVICE FOR CONNECTING PERIPHERAL UNITS TO A LINE FOR TRANSMITTING DATA BY PULSE CODE MODULATION

Jean-Pierre Laborie, Blagnac, and Michel Pevrol, Toulouse, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 29, 1975, Ser. No. 545,018
Claims priority, application France, Feb. 18, 1974, 74.05343
Int. Cl.[2] H04B 1/48
U.S. Cl. 325—23 7 Claims



1. A device for connecting a peripheral transmitting-receiving unit having an emitter portion for transmitting and a receiving portion for receiving signals to and from a two-conductor transmission line, having a characteristic impedance, said device transmitting and receiving data modulated by coded pulses, comprising in combination:

a. a first linking circuit connecting said transmission line to said peripheral unit, for the transmission of signals therefrom to said transmission line, said first linking circuit including a low impedance circuit, to establish transmission from said peripheral unit,

b. a second linking circuit separate and independent from said first linking circuit connecting said transmission line to said peripheral unit for receiving signals from said transmission line, said second linking circuit including a high impedance circuit,

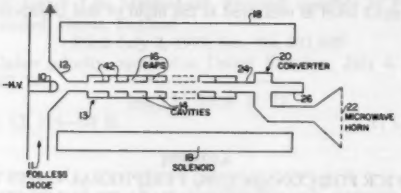
c. a third linking circuit connected with said first and said second linking circuits and with said peripheral transmitting receiving unit including a transformer electrically connected to the emitter and receiver portions of said peripheral unit, and

d. said first linking circuit including at least one group of semi-conducting diodes connected in series and electrically connecting one of the conductors of said two conductor transmission line and with said third linking circuit.

4,038,602
AUTOMODULATED REALTIVISTIC ELECTRON BEAM MICROWAVE SOURCE

Moshe Friedman, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1976, Ser. No. 661,208
Int. Cl.[2] H01J 25/02
U.S. Cl. 325—125 15 Claims



1. A microwave rf radiation generator comprising, in combination:

pulsed electron-beam producing mean for producing an intense relativistic electron beam;

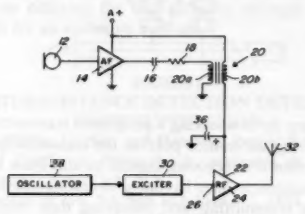
drift chamber means for energy-modulating said electron beam; and

converter means, through which said beams propagates, for converting said energy-modulated, relativistic electron beam into a density-modulated, relativistic electron beam and for extracting rf microwave energy from said density-modulated beam.

4,038,603
TRANSMITTER MODULATION LIMITER

Charles William Bethards, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,502
Int. Cl.[2] H04B 1/04
U.S. Cl. 325—182 11 Claims



1. In an amplitude modulated transmitter wherein an information signal amplitude modulates a radio frequency (RF) carrier, the improvement comprising:

a modulation transformer having primary and secondary windings;

means for modulating the RF carrier with the signal appearing at the secondary winding of the modulation transformer, the index of modulation of the RF carrier dependent on the amplitude of said transformer secondary signal;

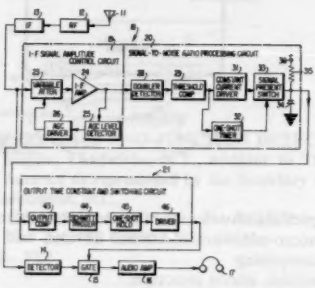
resistor limiting means adapted for coupling the information signal to the primary winding of the modulation transformer, the limiting means having a predetermined resistance such that the amplitude of the information signal appearing at the secondary of the modulation transformer modulates the RF carrier to, but not in excess of, a predetermined index of modulation; and

immpedance means coupled to the secondary of the modulation transformer for forming a filter network, having a predetermined characteristic, with the resistance of the resistor limiting means as transformed through the modulation transformer.

4,038,604
SIGNAL TO NOISE RATIO INDICATING CIRCUIT

Clement J. Koerber, Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Dec. 15, 1975, Ser. No. 640,876
Int. Cl.[2] H04B 1/10
U.S. Cl. 325—363 15 Claims

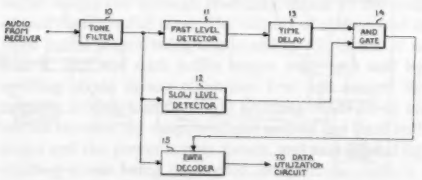


1. Apparatus for deriving a signal indicative of the signal to noise ratio of a carrier susceptible to being modulated by any of AM voice, AM pulse, CW, interrupted CW or angle modulated signals comprising means for deriving a waveform that is a replica of the amplitude variations of the envelope of the modulated carrier, a capacitor, and means responsive to the waveform for applying: (a) a constant current of one polarity to the capacitor while the waveform amplitude is above a threshold level indicative of a noise threshold, (b) a constant current of an other polarity to the capacitor for an initial predetermined time while the waveform is below the threshold level, and (c) a much smaller current of the other polarity to the capacitor during the time while the waveform is below the threshold level after the initial time, whereby the capacitor voltage level is indicative of the signal to noise ratio.

4,038,605
MESSAGE PREAMBLE DETECTOR

James H. Elder, Brookneal, and Hubert A. Patterson, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Mar. 5, 1976, Ser. No. 664,085
Int. Cl.[2] H03K 5/153, 5/18
U.S. Cl. 328—119 6 Claims



1. An improved arrangement for detecting signals representing a binary sequence and having a predetermined time duration, said arrangement comprising:

a. an input terminal for said signals;

b. a fast level detector connected to said input terminal for producing a fast detection signal after a predetermined first time period following receipt of said signals;

c. a time delay circuit connected to said fast level detector for producing a delayed signal after a predetermined second time period following receipt of said fast detection signal;
d. a slow level detector connected to said input terminal for producing a slow detection signal after a predetermined third time period following receipt of said signals;
e. said third time period being substantially equal to the sum of said first and second time periods;
f. and means connected to said time delay circuit and to said slow level detector for producing an output signal in response to the simultaneous presence of said delayed signal and said slow detection signal.

4,038,606
SEMICONDUCTOR DEVICE FOR STORING AND NON-DESTRUCTIVELY READING IMAGE INFORMATION AND MEMORY SYSTEM COMPRISING SUCH A DEVICE

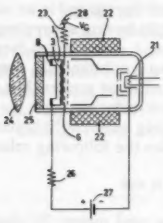
Arthur Marie Eugene Hoeberechts, and Marino Giuseppe Carasso, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 541,444, Jan. 16, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,742

Claims priority, application Netherlands, Feb. 14, 1974, 7402013

Int. Cl.² G11C *11/34*

U.S. Cl. 328—124 **10 Claims**



1. A semiconductor device having an electric and an optical input and an electric output for nondestructively reading information written in via the input and comprising a semiconductor target having a substrate of a first conductivity type, a regular pattern of island-shaped zones of a second conductivity type on one surface of said target, said zones forming p-n junctions with the adjoining part of the target, an electrically insulating layer covering at said surface at least said island-shaped zones, a conductive layer having apertures therein covering said electrically insulating layer and forming a read-out grating, said insulating layer having sufficient thickness to substantially prevent transfer of electrical charges and constitutes a dielectric in which information is stored, an aperture being present in the read-out grating above each island and leaving exposed at least a part of the insulating layer present on the island to permit information stored in said insulating layer to be read out.

4,038,607
COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER

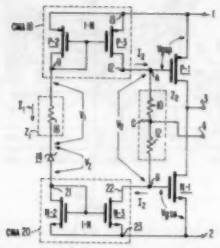
Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,536

Int. Cl.² H03F *3/185*

U.S. Cl. 330—13 **5 Claims**

1. An amplifier, comprising:
first and second supply terminals for receiving a supply voltage, V_s, thereacross which may vary over a voltage range;
an output terminal;
a pair of complementary field effect transistors, one transistor being connected at the source and drain electrodes thereof, respectively, to said first supply terminal and said output terminal, the other transistor being connected at the source and drain electrodes thereof, respectively, to said second supply terminal and said output terminal, each transistor having a gate electrode;
a direct current conductive impedance connected between said gate electrodes;
input means for applying an input signal to be amplified to at least one point on said impedance;



a first current mirror amplifier having a common terminal coupled to said first supply terminal, an output terminal coupled to said gate electrode of said one transistor and having also an input terminal;
a second current mirror amplifier having a common terminal coupled to said second supply terminal, an output terminal coupled to said gate electrdoe of said other transistor, and having also an input terminal; and
a current path coupled between said input terminals of said first and second current mirror amplifiers for conducting a first current therebetween when V_s is greater than a minimum value, said current path including a series connection of a further impedance and a threshold conduction device.

4,038,608
REDUNDANT OSCILLATOR FOR CLOCKING SIGNAL SOURCE

Howard B. Bard, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

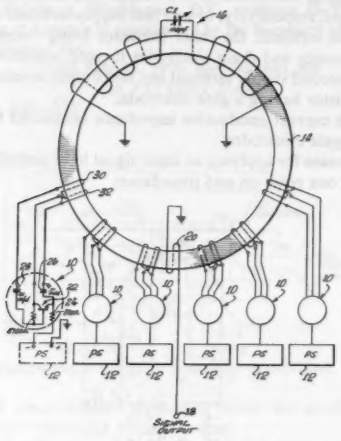
Filed May 7, 1976, Ser. No. 684,506

Int. Cl.² H03B *5/12*

U.S. Cl. 331—56 **3 Claims**

1. A redundant clocking signal source comprising:
a. a plurality of energy generators, each having a separate power source,
b. a High Q tank circuit,
c. a torroid core of magnetic material mutually coupling said energy generators to said resonant tank circuit,
d. an output circuit means mutually coupled by means of said

torroid core to said plurality of energy generators and providing and maintaining an output signal of a predetermined frequency when there is failure of at least one of said energy generators.



4,038,609

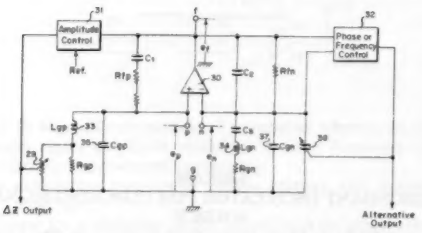
REPLICA BRIDGE SENSING CIRCUIT

Edwin Langberg, 33 Manning Lane, Cherry Hill, N.J. 08003

Filed July 19, 1976, Ser. No. 706,605

Int. Cl.[2] G01D *21/04*; G01R *33/00*; G01V *3/10*

U.S. Cl. 331—65 **14 Claims**



1. A sensing circuit comprising:

a. amplifier means having at least two inputs, and at least one output;

b. a bridge network having replica elements in corresponding branches;

c. said bridge network connected symmetrically between a source of alternating current and at least two of the inputs of said amplifier; and

d. means responsive to a change in attenuation of said bridge network for producing a signal connected to said amplifier.

4,038,610

LUMINOSITY CONTROL SYSTEM EMPLOYING SEMICONDUCTOR LASERS

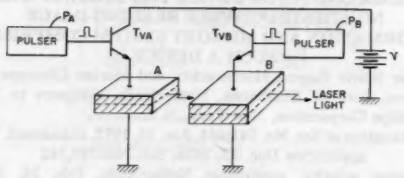
Jun-ichi Nishizawa; Ichiemon Sasaki, and Kaoru Takahashi, all of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

Continuation-in-part of Ser. No. 286,882, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 56,582, July 20, 1970, abandoned, and a continuation-in-part of Ser. No. 684,395, Nov. 20, 1967, abandoned. This application Oct. 11, 1974, Ser. No. 514,286

Claims priority, application Japan, Nov. 21, 1966, 41-76486; May 10, 1967, 42-29675

Int. Cl.[2] H01S *3/10*

U.S. Cl. 331—94.5 H **12 Claims**



1. A luminosity control device comprising:

a. a semiconductor laser operable in one mode to emit non-coherent light when a bias current below a threshold value I_Ath is applied thereto and in an inherent laser mode to emit coherent light having a wavelength λ_A when a bias current greater than I_Ath is applied thereto;

b. means for applying a substantially constant bias current having a value equal to or greater than about eight tenths of I_Ath to said semiconductor laser;

c. means for developing coherent light having a wavelength λ_B where λ_B satisfies the following relationship:

$$60A \geq \lambda_A - \lambda_B \geq 0; \text{ and}$$

d. means positioning said means for developing coherent light having a wavelength λ_B relative to said semiconductor laser to direct the coherent light having a wavelength λ_B to strike said semiconductor laser to bias said semiconductor laser to develop a coherent light output having a wavelength λ_B.

4,038,611

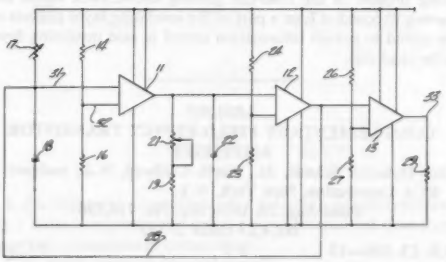
VARIABLE ON-AND OFF-TIME RELAXATION OSCILLATOR

Douglas J. Greig, 30053 Del Lane, Warren, Mich. 48091

Filed Feb. 27, 1976, Ser. No. 661,849

Int. Cl.[2] H03K *3/02*

U.S. Cl. 331—108 D **7 Claims**



1. A variable on-and off-time relaxation oscillator comprising:

a plurality of dual input terminal electron control means connected in cascade for generating outputs of predetermined polarities in response to inputs;

variable impedance means connected to one input terminal of a first of said electron control means;

first fixed impedance means connected to the other input terminal of said first electron control means;

the output terminal of said first electron control means being connected to one input terminal of a second of said electron control means, a resistance-capacitance network connected to said one input terminal of said second electron control means;

second fixed impedance means connected to the other input terminal of said second electron control means;

the output terminal of said second electron control means being connected to an input terminal of a third electron control means, the polarity of the output of said second electron control means being the opposite of the polarity of said first and third electron control means;

third fixed impedance means connected to the other input terminal of said third electron control means;

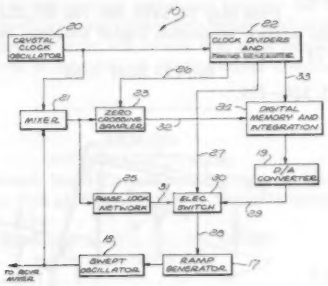
the output terminal of said second electron control means being coupled to said one input terminal of said first electron control means so that an output signal on the output terminal of said second electron control means causes said first and third electron control means to be turned off and said resistance-capacitance network controls the off-time of said variable on-and off time relaxation oscillator.

4,038,612

SWEPT OSCILLATOR AUTOMATIC LINEARIZER

Robert P. Borofka, Granada Hills, and Lynn R. Barton, Glendale, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,750
Int. Cl.[2] H03B *23/00*
U.S. Cl. 331—178 **5 Claims**



1. A device for producing a repetitive, linear, frequency ramp, comprising:

a signal-controlled oscillator and a ramp generator for generating and applying a repetitive oscillator control signal as a frequency controlling function to said oscillator to produce said frequency ramp;

a zero-crossing sampler responsive to said frequency ramp;

synchronizing means for controlling the initiation of each cycle of said repetitive oscillator control signal and for generating a series of sampling signals for said zero-crossing sampler at predetermined points in times at which the waves of said frequency ramp should be passing through zero if df/dt is constant, where f is ramp frequency and t is time;

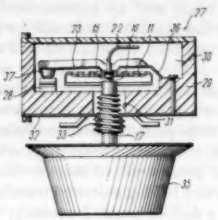
means for integrating the output of said sampler over at least a single cycle of said frequency ramp to generate a corresponding repetitive error signal, and for applying said error signal as a correction signal to said ramp generator to provide said oscillator control signal in whatever modified form is required to linearize said frequency ramp.

4,038,613

TEMPERATURE RESPONSIVE DEVICES

Karl Fischer, Am Gaensberg, 7519 Oberderdingen, Germany

Filed Mar. 21, 1975, Ser. No. 560,926
Claims priority, application Germany, Mar. 27, 1974, 2414812
Int. Cl.[2] H01H *37/34, 37/40*
U.S. Cl. 337—321 **25 Claims**



1. A temperature-responsive device comprising an expansible box comprising two sheet metal members which are interconnected in a sealed manner; a temperature sensor; a capillary tube connected to the latter; means connecting said capillary tube to said expansible box; an expansible fluid filling said temperature sensor, said capillary tube and said box; a movable transmission lever which is rigidly connected with said expansible box at the side of one of said sheet metal members, said lever having an opening through which said capillary tube passes;

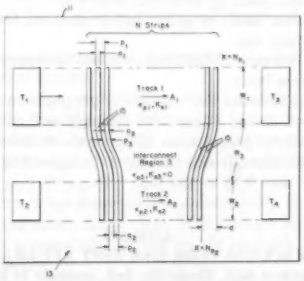
said one sheet metal member having a central region with an opening therein and said connecting means comprising a connection piece secured to said one sheet metal member and having an inner flange which is located inside said expansible box and a tubular portion which extends outwardly through said opening, said capillary tube being inserted into said tubular portion.

4,038,614

FRACTIONAL EFFICIENCY COUPLER

Charles Weldon Chapman, and Thomas W. Bristol, both of Orange, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 16, 1975, Ser. No. 587,485
Int. Cl.[2] H03H *9/26, 9/30, 9/32;* H01L *41/04*
U.S. Cl. 333—30 R **5 Claims**



1. A Fractional efficiency surface acoustic wave coupling device, comprising:

a substrate of piezoelectric material having a surface capable of supporting propagating surface acoustic wave energy;

input means including an input transducer disposed on said surface for launching surface acoustic wave energy along a first track on said surface in response to an electrical input signal;

output means including an output transducer disposed on said surface for detecting surface acoustic wave energy propagating along a second track on said surface and producing a corresponding electrical output signal; and

coupler means including a multistrip coupling array of a predetermined number N of conductive strips disposed on said surface, said coupling array having a tapping portion in said first track and an approximately equal length launching portion in said second track for launching along said second track only a portion of said surface acoustic wave energy incident on said tapping portion, the strip period p_1 of said strips in said tapping portion being different than the strip period p_2 of said strips in said launching portion, the strip period difference being defined by a predetermined strip period ratio p_1/p_2 which in conjunction with said predetermined strip number N provides a broadband device having a desired transfer efficiency less than unity at a desired center frequency, the downstream end of said launching portion of said multistrip coupling array being offset by a distance d in an upstream direction relative to the downstream end of said tapping portion to provide a desired phase shift characteristic.

4,038,615

ELASTIC SURFACE WAVE DEVICE

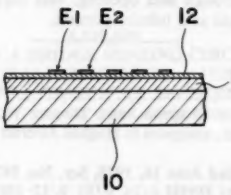
Hideki Ishiyama; Atushi Inoue, and Hideharu Ieki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,764

Claims priority, application Japan, Mar. 4, 1975, 50-26858; Mar. 4, 1975, 50-26859; Sept. 4, 1975, 50-107658; Nov. 7, 1975, 50-152144

Int. Cl.[2] H03H *9/04, 9/26, 9/32;* H01L *41/18*

U.S. Cl. 333—72 **4 Claims**



1. An elastic surface wave device which comprises;

a substrate made of dielectric material;

a thin layer made of piezoelectric material formed on said substrate; and

at least one pair of electrodes formed between said substrate and thin layer;

the ratio between the velocity of propagation of the elastic surface waves transmitted through said substrate to the velocity of propagation of the elastic surface waves transmitted through said thin layer being within the range of more than 0.85 to less than 1.15.

4,038,616

VACUUM TUBE GAS TEST APPARATUS

Ervin Matthew Ball, Zionsville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,694

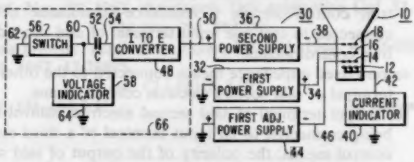
Int. Cl.[2] G01R *31/024*

U.S. Cl. 324—20 CR **16 Claims**

1. An apparatus for measuring gas current (I_g) in the presence of leakage current (I_l) in a vacuum tube, said apparatus comprising:

a. means for energizing said tube to produce a current (I_k) from a cathode to a first electrode and said I_g and said I_l to a second electrode of said tube;

b. means for energizing said tube to prevent said I_k and I_g but to produce said I_l;



c. means for generating a first voltage proportional to the sum of said I_g and said I_l and a second voltage proportional to said I_l; and

d. means for applying said first and second voltages sequentially to a voltage differentiation means to produce a third voltage which is equal to the difference between said first and second voltages and which is representative of said I_g.

4,038,617

APPARATUS FOR INDICATING THE OUTPUT OF A MACHINE

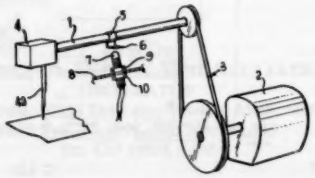
Joseph Milom, 8 Anson Road, Victoria Park, Manchester 14, England

Filed May 14, 1975, Ser. No. 577,232

Claims priority, application United Kingdom, Sept. 27, 1974, 42178/74

Int. Cl.[2] G01P *3/66*

U.S. Cl. 324—179 **8 Claims**

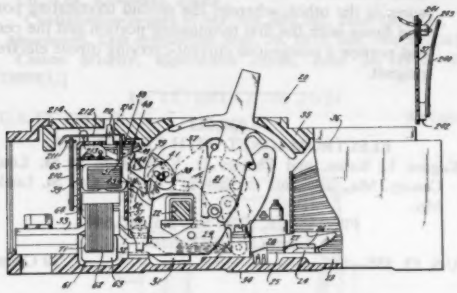


1. In combination with a machine having a part undergoing cyclic movement during operation, means for registering operation of the machine comprising a detector device having a magnetic coil and a pole piece spaced by an air gap from said part, means connected to the coil for establishing a magnetic field in said air gap periodically traversed by said part during said cyclic movement thereof, a counter device connected to the coil for receiving pulse signals generated in the coil by said part traversing the magnetic field, and indicator means connected to the counter device for visually registering the number of operational cycles of the machine, the counter device including a Schmitt Trigger pulse circuit and a pair of series connected decade counters, one of the counters being driven by the pulse circuit and the second of the counters being connected to a drive transistor, the drive transistor being connected to the second decade counter through a capacitor.

4,038,618
CIRCUIT BREAKER HAVING THERMAL AND SOLID STATE TRIP MEANS

Carl E. Gryctko, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 12, 1976, Ser. No. 675,968
Int. Cl.[2] H01H 73/00, 73/48
U.S. Cl. 335—23 6 Claims

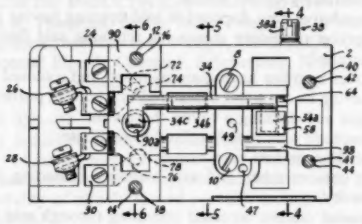


1. A circuit breaker including cooperating contact means; an operating mechanism operatively connected to said contact means: a latch means normally maintaining and said mechanism latched in position for opening and closing said contact means; solid state trip means having a first portion for monitoring currents flowing in said breaker, a second portion for processing signals generated by said first portion, and a third portion for releasing said latch means to automatically trip said mechanism thereby opening said contact means responsive to a trip signal generated by said portion when predetermined overload currents flow in said breaker; a housing wherein said contact means, said operating mechanism, said latch means and said trip means are disposed; a thermally responsive first means disposed within said housing and insulated from electrical and thermal conduction with current carrying elements in said housing whereby temperature of said first means is essentially a function of air temperature within said housing; and second means operatively connecting said first means with said latch means whereby the latter will release said latch means when said first means is subjected to predetermined conditions of temperature.

4,038,619
PNEUMATIC TIMER

Frederic Oakland, Hales Corners, and Edward A. Mallonen, New Berlin, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 1, 1975, Ser. No. 618,579
Int. Cl.[2] H01H 7/03
U.S. Cl. 335—61 5 Claims

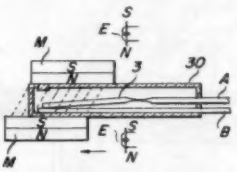


1. A timing device comprising:
a housing:
a lever mounted in said housing for rotational movement about its longitudinal axis and having a plurality of cams extending transversely therefrom;
an actuator mounted in said housing for reciprocal movement and having a portion engaging a first of said cams;
biasing mans biasing said lever in one direction of rotation thereof;
an operator movably mounted in said housing and having a camming tip engageable with a second of said cams such that in one direction of movement of said operator, said camming tip disengages said second cam to allow said lever to rotate under the bias of said biasing means and such that in the opposite direction of movement of said operator, said camming tip engages said second cam to rotate said lever against the bias of said biasing means;
pneumatic time delay means mounted in said housing and having a movable timing head in engagement with a third of said cams to adjustably retard the rate of rotation of said lever under the bias of said biasing means; and
switch means mounted in said housing for effecting switching operations in response to a predetermined amount of movement of said actuator corresponding to a predetermined amount of rotation of said lever.

4,038,620
MAGNETIC REED SWITCH

B. Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309, and Charlie Dwain Mariner, 2846 Greenway Blvd., Falls Church, Va. 22042

Continuation-in-part of Ser. No. 533,223, Dec. 16, 1974, Pat. No. 3,943,474, which is a division of Ser. No. 404,612, Oct. 9, 1973, Pat. No. 3,866,007. This application Sept. 8, 1975, Ser. No. 611,156
Int. Cl.[2] H01H 1/66
U.S. Cl. 335—153 67 Claims

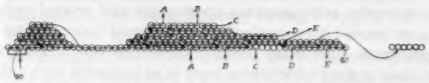


1. A reed switch comprising:
a. a first reed of conductive magnetic material
b. a second reed of conductive non-magnetic material mounted in cooperating spaced relation to said first reed.
c. said first reed comprising a body of conductive material having a contact section, an intermediate spring section and a support section
d. said intermediate section being foil-thin
e. said contact section being substantially rigid and non-flexible
f. said contact section being substantially thicker than said intermediate section
g. said intermediate section comprising a leaf spring having a flexibility permitting one end of said leaf spring to flex a substantial distance through an arc with respect to the other end of said leaf spring without exceeding the elastic limits of said spring.
h. said intermediate section being substantially harder, less ductile and more dense than said contact section and having a substantially higher tensile strength than said contact section
i. a magnetic operator mounted in cooperating spaced relation to said first and second reeds
j. whereby cooperative operation of said magnetic operator with said magnetic causes said magnetic reed to move into or out of contact with said non-magnetic reed.

4,038,621
PRECISION VERTICAL DEFLECTION COIL FOR A HYBRID TELEVISION YOKE

Wayne R. Chiodi, Northbrook, and Bryan R. Grummon, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 16, 1976, Ser. No. 667,918
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—213 **6 Claims**

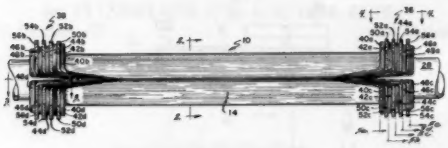


1. An electromagnetic deflection yoke comprising:
a liner;
saddle wound horizontal deflection coils mounted on one side of said liner;
a magnetically permeable substantially smooth core adjacent the opposite side of said liner; and
a pair of vertical deflection coils toroidally wound in a wave sequence on said core, each having a repeatable multilayer precision stack of wire turns with only said wire turns providing support for maintaining said multilayer precision stack.

4,038,622
SUPERCONDUCTING DIPOLE ELECTROMAGNET

John R. Purcell, San Diego, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 13, 1976, Ser. No. 676,585
Int. Cl.[2] H01F *7/22*
U.S. Cl. 335—216 **5 Claims**



1. A superconducting dipole electromagnet wound of wires formed by a filament of superconducting material embedded in a normal conductor that is enclosed in an electrically insulating material, the electromagnet exhibiting cylindrical symmetry about an axis, the electromagnet comprising:

a. a central portion of said wires disposed substantially parallel to each other and to the axis of cylindrical symmetry, the wires in said central portion disposed in two crescent-shaped cross-sections defined by non-intersecting portions of two equal circles having centers on a line through the axis and perpendicular to the axis, the centers equidistant from the axis, the wires in one of said two crescent-shaped cross-sections disposed to carry electric current in a first direction parallel to the axis and the wires in the other of said two crescent-shaped cross-sections carrying electric current in an opposite direction;

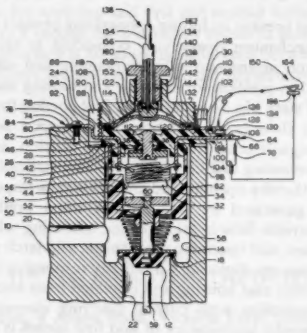
b. a first terminating portion of said wires connected electrically to the central portion at a first end to form a plurality of looping portions, each of said looping portions connecting wires from one of said crescent-shaped cross-sections to wires in the other of said crescent-shaped portions and continuing an electric circuit therethrough, the fractional number of wires in each of said looping portions equalling the reciprocal of the number of said plurality, further unlooped portions of said wires disposed in cross-sections bounded by arcs of two bounding circles equal in size to said two equal circles, the centers of the bounding circles moving into coincidence upon approaching an end of the magnet; and

c. a second terminating portion of said wires connected to the central portion at a second end opposite to said first end and exhibiting mirrored symmetry to said first terminating portion, the second terminating portion carrying electric current connected to continue an electric circuit from wires in one of said crescent-shaped cross-sections to wires in the other, whereby the second terminating portion forms with the first terminating portion and the central portion a continuous current-carrying dipole electromagnet.

4,038,623
ELECTROMAGNET WITH TERMINALS

Eugene L. Kamp, and Charles D. Visos, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 6, 1976, Ser. No. 683,644
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—219 **10 Claims**



1. In a control device adapted to be energized by a thermocouple and to be connected in circuit with controlling circuit means,

a housing having an opening therein comprising a lower portion and a threaded upper portion;
thermocouple connector means threadedly engaged to said upper portion of said opening having an internally threaded bore for receiving coaxial terminal means of said thermocouple;
a first electric terminal spaced from said connector means and said housing having one end in said opening in alignment with said bore for connection to one terminal of said thermocouple terminal means and having another end extending externally of said opening for connection to said controlling circuit means;
an insulative base disposed in said opening having an upper portion providing means for retaining said first electric terminal;
a cover member having an open end and a closed end and having its open end connected to a bottom portion of said base and defining a cavity therewith;
a magnetic core member fixed to said base;
a winding on said core member;
said core member and said winding extending into said cavity;
a second electric terminal extending through said base and having one end extending externally of said opening for connection to said controlling circuit means and having another end extending into said cavity and connected to one end of said winding; and
a third electric terminal extending through said base and having one end extending externally of said opening and attached to said housing and having another end extend-

ing into said cavity and connected to the other end of said winding.

4,038,624

ROTARY TRANSFORMER

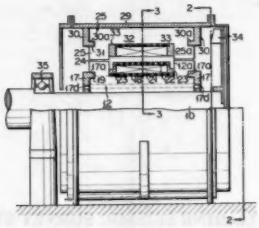
Masanao Namba; Masateru Kuniyoshi, and Akira Kobayashi, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 480,385, June 18, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,245

Claims priority, application Japan, June 26, 1973, 48-75958[U]

Int. Cl.² H01F *27/08, 27/24*

U.S. Cl. 336—60 **9 Claims**



1. A rotary transformer comprising:

a cylindrical housing;

a stator core including a plurality of iron blocks and an annular recess therein, each block being made of U-shaped, laminated iron plates each having the same and uniform thickness and arranged on the inner wall of said housing, and any two adjacent blocks being spaced from each other for a distance at the outer edges and contacted with each other at the inner edges;

a rotary shaft;

a rotor core including a plurality of iron blocks and an annular recess therein, each block being made of U-shaped, laminated iron plates each having the same and uniform thickness, arranged on the periphery of said rotary shaft, and having the outer end spaced from the inner surface of said stator core;

a stator coil disposed in the recess of said stator core;

a rotor coil disposed in the recess of said rotor core;

first fastening means engaging the end face of every stator iron block to thereby fix the stator iron blocks and secure the stator core to the housing; and

second fastening means engaging the end face of every rotor iron block to thereby fix the rotor iron blocks and secure the rotor core to the rotary shaft.

4,038,625

MAGNETIC INDUCTIVELY-COUPLED CONNECTOR

Russell E. Tompkins, Scotia, N.Y.; Franklin A. Fisher, Pittsfield, Mass., and Robert P. Wanger, Fairfield, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 7, 1976, Ser. No. 693,298

Int. Cl.² H01F *15/02*

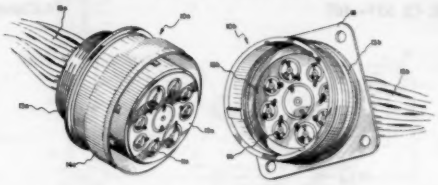
U.S. Cl. 336—83 **2 Claims**

1. An inductive connector comprising

a pair of mating metallic housing units within each of which is mounted a metallic support plate respectively having a plurality of closely spaced recesses arranged in the same pattern,

a plurality of transformer couplings each made in two separable sections which are received in opposing recesses in said support plates,

each two-section transformer coupling comprising a ferrite magnetic core composed of two substantially identical, one-piece, opposing cup-type core halves each including a center member about which one transformer winding is disposed and also an outer member, said core halves when assembled having a magnetic gap therebetween with the transformer windings and center members collinear and magnetically coupled and further substantially enclosed by said outer members.



a protective coating over at least exposed areas of said core halves and transformer windings, and

means for releasably clamping together said housing units with the two sections of each transformer coupling in alignment.

4,038,626

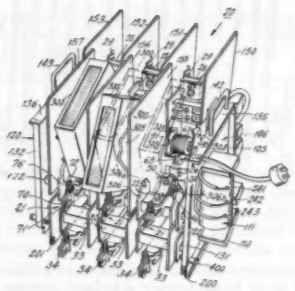
HIGH VOLTAGE CONTACTOR

John L. Haydu, Towson; Michel M. Fenneteau, Gaithersburg, and Byron C. Mann, Kingsville, all of Md., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed June 11, 1975, Ser. No. 585,774

Int. Cl.² H01H *83/00*

U.S. Cl. 337—4 **32 Claims**



1. A contactor comprising a stationary contact and a movable contact; the movable contact being operable into engagement with said stationary contact and out of engagement therewith to open a circuit through said contacts;

a control circuit for said contactor comprising an electromagnet and an armature;

means for energizing said electromagnet to move said armature toward said electromagnet;

a mechanical connection between said armature and said movable contact;

said movable contact being driven into engagement with said stationary contact when said armature is drawn to said electromagnet;

additional electromagnetic means for retaining said armature in a position in which said movable contact is engaged with said stationary contact;

biasing means driving said movable contact away from said stationary contact;

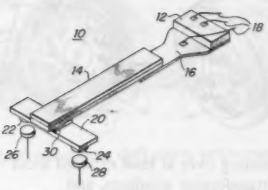
and means for opening the circuit to said additional electromagnetic means thereby releasing said armature and permitting said biasing means to move said movable contact away from said stationary contact.

4,038,627

ELECTRO-THERMAL ISOLATING SWITCH

Brant T. Johnson, 123 Carlisle Pines Drive, Carlisle, Mass. 01741

Filed Apr. 14, 1975, Ser. No. 567,992
Int. Cl.[2] H01H 61/02, 63/013
U.S. Cl. 337—107 4 Claims



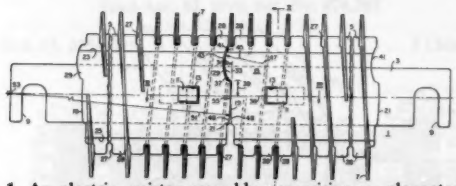
1. The switch of claim 1 including a low thermal conductivity support member for supporting and for reducing heat loss from said semiconductor device.

4,038,628

ELECTRIC RESISTOR

Nicholas A. Salemi, Plum Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1976, Ser. No. 698,226
Int. Cl.[2] H01C 10/14
U.S. Cl. 338—318 9 Claims



1. An electric resistor assembly comprising an elongated mounting strap having terminals at both ends respectively for panel mounting, the mounting strap having a flexing direction, a plurality of insulating refractory bodies disposed on the strap in end-to-end abutment, the bodies having opposite vertical side walls, opposite end walls, and upper and lower edges, one end wall of each body having a bulged portion protruding from the end wall, the other end wall having a concavity corresponding to and receptive of the bulged portion of adjacent body, to enable angular motion of the adjacent bodies in the flexing direction, and a helical resistance conductor mounted on and surrounding the bodies.

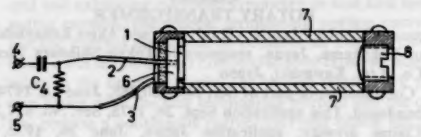
4,038,629

PROPAGATION DELAY METER

Cornelis Martinus van der Burgt, and Gerardus Andreas van Maanen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,349
Claims priority, application Netherlands, May 6, 1974, 7406033
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 E 10 Claims

1. Apparatus for measuring the propagation delay of an acoustic wave in a fluid medium comprising, a transducer for launching an acoustic wave along a given path in the fluid medium, a reflector of acoustic energy positioned in the fluid medium in the path of said acoustic wave at a distance from the transducer which is less than $\frac{1}{2}$ times the length of the Fresnel region of the acoustic wave launched by the transducer and greater than one half times said Fresnel region, said reflector having a convex surface facing the transducer for reflecting the launched acoustic wave back towards the transducer, and



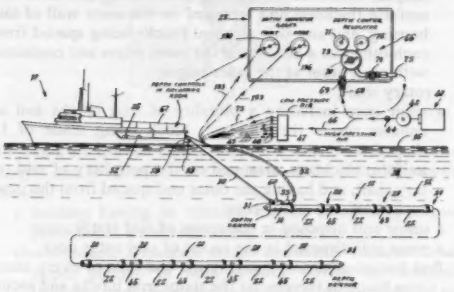
means coupled to the transducer and responsive to an acoustic wave reflected back from the reflector for deriving an electric control signal.

4,038,630

AIRGUN MARINE SEISMIC SURVEY STREAMER METHOD AND APPARATUS

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Oct. 28, 1975, Ser. No. 625,886
Int. Cl.[2] G01V 1/38, 1/02
U.S. Cl. 340—7 R 28 Claims



1. The method of employing airguns each having a plurality of neighboring discharge ports for generating marine seismic impulses comprising the steps of:

positioning a plurality of such airguns of generally elongated cylindrical configuration in axial alignment along a line at spaced positions,

interconnecting each axially aligned airgun in the line to the next successive airgun by a flexible sleeve axially aligned with the respective airguns to which it is connected for forming chambers within the sleeves between successive airguns while leaving all of the neighboring discharge ports of each airgun exposed to the ambient between the successive flexible sleeves, thereby forming a flexible steamer in which said airguns are axially aligned and having the discharge ports of all of the airguns therein exposed to the ambient,

towing the airgun streamer from one end through the water, and

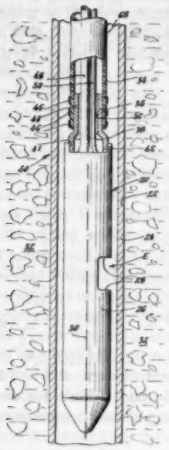
feeding the high pressure compressed air along the streamer by-passing preceding airguns for supplying high pressure compressed air to each of the air guns in the streamer and suddenly discharging high pressure air through the exposed ports of the streamer for generating seismic impulses in the water.

4,038,631

METHOD FOR GENERATING AND DETECTING SEISMIC SHEAR WAVE ENERGY IN THE EARTH

Vincent J. Murphy, 89 Traincroft, Medford, Mass. 02155

Filed Nov. 7, 1975, Ser. No. 629,810
Int. Cl.[2] G01V *1/00*
U.S. Cl. 340—15.5 BH 7 Claims



3. The method of making determinations of seismic shear wave velocities in the earth at sites where large civil engineering structures are proposed to be built comprising the steps of:

providing at least two boreholes in the earth,

providing an airgun capable of being lowered into one of said boreholes and having only one discharge port directed radially outwardly from one side of the airgun,

lowering said airgun into said one borehole,

aiming the airgun therein to a sequence of predetermined azimuths relative to the other borehole,

firing the airgun while it is being aimed at each of the azimuths in the predetermined sequence, and

sensing the resulting seismic waves appearing in the earth at said other borehole.

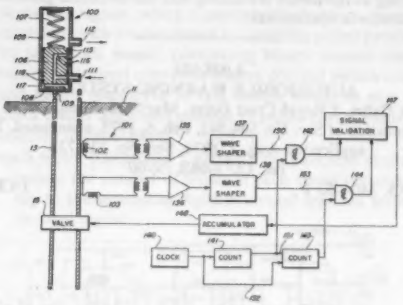
4,038,632

OIL AND GAS WELL DISASTER VALVE CONTROL SYSTEM

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation-in-part of Ser. No. 294,289, Oct. 2, 1972, Pat. No. 3,961,308. This application Nov. 6, 1975, Ser. No. 629,515
Int. Cl.[2] E21B *35/00*
U.S. Cl. 340—18 NC 11 Claims

1. A system for communicating into an oil or gas well comprising a gas or oil tubing extending down into said well to a disaster valve near the bottom of the tubing, means near the top of said tubing for selectively transmitting cyclically recurring sonic energy signals through the walls of said tubing when a control function is desired, said signals resolving themselves into vertical and time displaced horizontal sonic energy signals, means near the bottom end of said tubing for detecting and comparing the recurring vertical signals with the time displaced horizontal signals transmitted through said walls, and means responsive to said detection and comparison of said



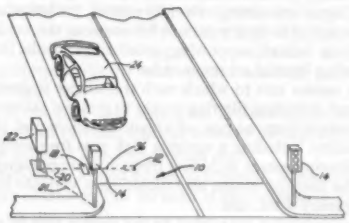
signals for selectively performing said control function upon said disaster valve.

4,038,633

DETECTION SYSTEM FOR AUTOMOBILES AND OTHER MOTOR-DRIVEN OBJECTS

Frederick N. King, 5068 Franklin Ave., Los Angeles, Calif. 90027

Continuation of Ser. No. 390,364, Aug. 22, 1973. This application Apr. 21, 1975, Ser. No. 569,708
Int. Cl.[2] G08G *1/00*
U.S. Cl. 340—38 L 12 Claims



1. Apparatus for indicating the nonmoving presence of motor-driven objects and the like comprising:

means for coupling to the changing magnetic field radiated by the flow of pulsating D.C. or A.C. ripple current supplied to the electrical system of a motor-driven object by a rotational electrical generating device contained in the electrical system of and driven by the motor of the motor-driven object;

said coupling means comprising a coil of small diameter copper wire wound on a laminated, ferrite iron core connected through an electrical connection to the input of a signal developing means to continuously detect the presence of motor-driven objects in close proximity to said coupling means independently of whether the motor-driven object being sensed is in motion;

said signal developing means comprising a system of midraange filter means, operational amplifier means, a rectifier means and an indicating means all coupled in sequence; whereby

A.C. current of a frequency the same as the frequency of the changing magnetic field radiated by the ripple current is induced in the windings of said coupling means and fed through said signal developing means which removes electrical energy of undesirable frequencies induced in said coupling means and passes only those in the range of frequencies of ripple current generated in the electrical

systems of motor-driven objects to actuate said indicating means to continuously indicate the presence of a motor-driven object in close proximity to the sensing means so long as the motor is running and the electrical generating device is operational.

4,038,634

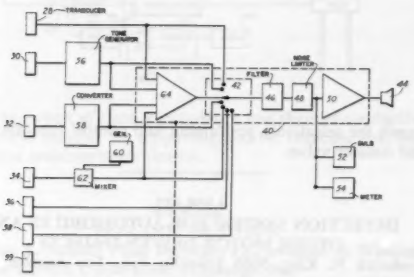
AUTOMOBILE WARNING SYSTEM

Frank Caliri, 2 Royal Crest Drive, Marlboro, Mass. 01752

Continuation of Ser. No. 544,242, Feb. 6, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,722

Int. Cl.[2] G08B *19/00*

U.S. Cl. 340—52 F **1 Claim**



1. A warning system for installation in a vehicle to report the condition of various critical running gear comprising

a. a plurality of transducers, each transducer being located at a different position adjacent a critical running gear in the vehicle to receive impulses from such gear and to generate a signal containing raw information, the transducers being attached to their positions by magnets, the vehicle having front wheel supporting members and the transducers being located on the members.

b. a master unit to which each transducer is connected, the unit including filtering means to remove extraneous information from the raw information in the signal, the filtering means including a variable high-pass frequency filter, the filtering means including frequency suppressing elements, the filtering means also including a variable lowpass frequency filter, and

c. an indicator connected to the master unit to receive the remaining signal.

4,038,635

VEHICLE INTRUSION ALARM CIRCUIT

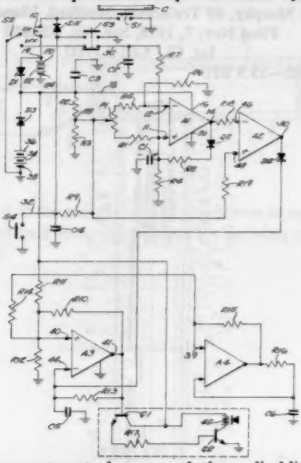
Larry A. Schotz, 6220 N. Sunny Point Road, Glendale, Wis. 53217

Filed Jan. 2, 1976, Ser. No. 646,095

Int. Cl.[2] B60R *25/10*

U.S. Cl. 340—63 **16 Claims**

1. A vehicle intrusion alarm circuit for use in combination with a vehicle having at least one compartment, an openable compartment closure therefore, at least one electrical load element for coupling to a battery, and switch means for energizing said load element when said compartment closure is opened, said intrusion alarm circuit comprising an operational amplifier having two inputs and an output, said operational amplifier being operable to produce an output signal which is proportional to the difference between its two input signals, means coupling both of said operational amplifier inputs to the ungrounded terminal of said battery, a capacitor coupled between one operational amplifier input and ground, the voltage on said capacitor and said one input being substantially equal to the voltage on said other input when the load element is deenergized and the voltage on said other input changing incidental to energization of said load element and coincidental change in said battery voltage to thereby produce a voltage difference between said inputs for operating said amplifier, alarm means coupled to the operational amplifier output, said alarm means being operable to produce an audible alarm in response to an output signal of said operational amplifier caused by the opening of said compartment closure, and alarm disabling means accessible from outside said vehicle for disabling said alarm circuit to permit opening of said compartment closure without activating said alarm.



4,038,636

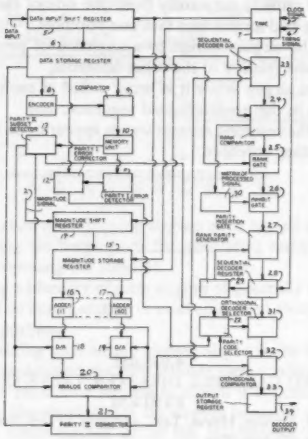
MULTIPLE DECODING SYSTEM

George D. Doland, 1602 Redway Lane, Houston, Tex. 77062

Filed June 18, 1975, Ser. No. 588,028

Int. Cl.[2] G06F *11/12*

U.S. Cl. 340—146.1 AV **3 Claims**



1. A Parity decoder for decoding coded digital data consisting of the data and parity check bits, the decoder comprising, a serial data input shift register means for accepting the coded data, a timer means for synchronizing the operation of said decoder by using a clock input and timing signal input, a magnitude shift register means for accepting magnitude data related to the coded digital data, said timer is connected to said data input shift register and said magnitude shift register, said clock signal via said timer causes the transfer to data in said data input shift register from the input end toward the output end of said data input shift register, similarly said clock signal causes the transfer of the magnitude signal data from the input

of said magnitude shift register toward the output of said magnitude shift register, said data input shift register is connected to a data storage register means which stores the digital data, said magnitude shift register is connected to a magnitude storage register means which stores the magnitude data, a signal from said timer which is connected to said data storage register and said magnitude storage register transfers the data from said data input shift register to the data storage register and transfers the magnitude data from said magnitude shift register to said magnitude storage register, said data storage register is connected to an encoder means which encodes the uncoded portion of the data stored in said data storage register, said encoder is connected to a comparitor means and said comparitor is also connected to said data storage register, said comparitor compares the check bits from said encoder with check bits from the data storage register and generates error signals, said comparitor is connected to a memory unit means, said memory unit is connected to a Parity II subset detector means and to a Parity I error detector means, said memory unit recognizes the error signal pattern and provides control signals to said Parity I error detector and said Parity II subset detector, said Parity I error detector is connected to Parity I error corrector means, said data storage register is also connected to said Parity I error corrector, said Parity I error corrector corrects one bit error in the digital data from said data storage register using a corrector signal from said Parity I error detector, said Parity I error corrector is connected to a Parity code selector means, said magnitude storage register is connected to a plurality of added means, said adders add the magnitude data for pairs of bits, said adders are connected to a plurality of digital data to a set of analog voltages, said Sequential decoder analog to digital converter is connected to a rank comparitor means which orders the signals based upon absolute magnitude, said timer is connected to said rank comparitor, said timer signal allows passage of the signals in sequence starting with the signal with greatest magnitude, said rank comparitor is connected to a rank gate means, said data storage register is connected to said rank gate, said rank comparitor output signals allows passage of the data from said data storage register through said rank gate, said rank gate is connected to an inhibit gate means, said inhibit gate inhibits passage of data bits when sufficient data bits have been processed to determine the data bits inhibited using data previously processed, said inhibit gate is connected to a parity insertion gate means, said parity insertion is connected to a Sequential decoder register means, said Sequential decoder register stores data from said parity insertion gate, said Sequential decoder register is connected to a rank parity generator means, said rank parity generator encodes data stored in said Sequential decoder register, said rank parity generator is connected to said parity insertion gate, said rank comparitor is connected to a matrix of processed signal means, said matrix of processed signals determines when a sufficient number of data bits have been processed to determine other data bits which have not been processed, said matrix of processed signals is connected to said inhibit gate and said parity insertion gate, control signals from said matrix of processed signals inhibit processing of signals in said inhibit gate and insert data generated by said rank parity generator in said parity insertion gate, the output signal from said Sequential decoder register is the Sequential decoder output, said timer is connected to said Sequential decoder register, said timer signal resets said Sequential decoder register to zero after processing each word.

4,038,637

ACCESS CONTROL SYSTEM

Sherman M. Peters, 5209 S. Vadalia, No. 5, Tulsa, Okla. 74135

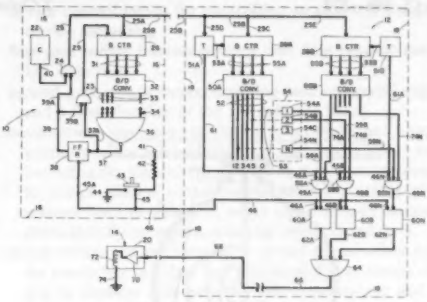
Filed Nov. 24, 1975, Ser. No. 634,347
Int. Cl.[2] E05B *49/00*
U.S. Cl. 340—147 MD **3 Claims**

1. A system for access control comprising;

a. storage means at a control location, and means for entering into said storage means signals representative of a first selected series of decimal digits, said storage means being decimal switch means;

b. means at an access location for generating a plurality of sequential signals, which comprises clock means, means to start said clock means; means to count the pulses produced by said clock means, comprising binary counter means; binary to decimal converter means; decimal switch means; and means responsive to said switch means to stop said clock means when said number of pulses corresponds to a selected decimal digit;

each signal comprising a plurality of sequential electrical pulses, the number of pulses in each signal corresponding to the sequential digits in second selected series of decimal digits;



c. means to transmit said sequential pulses of each of said sequential signals from said access location to said control location over a signal conductor;

d. means including binary counter means and binary to decimal converter means for converting said sequential pulses of said sequential signals to sequential decimal digits corresponding to said second selected series of decimal digits; and

e. means to compare said sequential decimal digits corresponding to said second selected series of decimal digits to said first selected series to decimal digits;

f. means responsive to said means to compare, to set each of a plurality of latches, one for each of said sequential digits; and

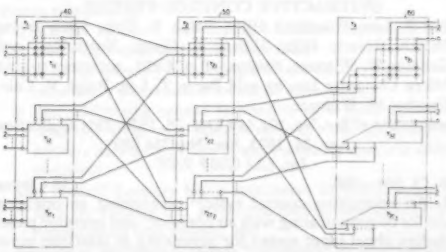
g. means responsive to said plurality of latches, set in the proper order, for granting access.

4,038,638

EFFICIENT REARRANGEABLE MULTISTAGE SWITCHING NETWORKS

Frank Kwangming Hwang, Piscataway Township, Middlesex County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 1, 1976, Ser. No. 691,898
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 340—166 R **8 Claims**



1. A multistage switching network subdivided into a first stage, a second stage, and a third stage characterized in that:

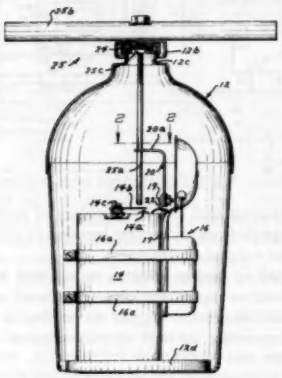
said first stage comprises an *n* plurality of switches;
said second stage comprises no more than an $n+1$ plurality of switches;
said third stage comprises an *n* plurality of switches; and
exactly two of said stages comprise two-sided rearrangeable switches.

4,038,639

BIRD PERCH ALARM

Glenn M. Kuebler, Rte. 3, Box 128, Bell Road, Newburgh, Ind. 47630

Filed Jan. 16, 1976, Ser. No. 649,643
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—272 **2 Claims**



1. A bird perch alarm comprising a movable bird perch assembly mounted on a housing and responsive to the weight of an alighting bird, said bird perch assembly including a cap mounted on a neck of said housing and a plunger extending into said housing through said neck, resilient material disposed within said cap compressing upon movement of said cap on said neck by an alighting bird, audible means responsive to movement of said plunger, and an electrical circuit to said audible means completed upon movement of said plunger.

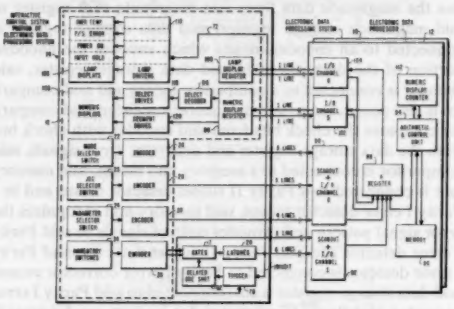
4,038,640

INTERACTIVE CONTROL SYSTEM

Barry T. Lee, Woodland Hills; Ralph V. Cole, Simi; Irving Hirsch, Beverly Hills; Gilbert P. Hyatt, Northridge, and Gunther W. Wimmer, Saugus, all of Calif., assignors to said Micro Computer Inc. by said Barry T. Lee, Ralph V. Cole, Gunther W. Wimmer

Continuation of Ser. No. 101,449, Dec. 28, 1970. This application Apr. 24, 1973, Ser. No. 354,590
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—200 **15 Claims**

1. An interactive control system comprising an operator panel for communicating with an operator; said operator panel including panel input means for generating at least one input signal in response to an operator input action, display register means for storing at least one display signal from a data processor, and display output means for providing an operator display in response to the display signal stored in said display register means; said interactive control system further comprising a stored program data processor processing digital data including memory means for storing a plurality of instructions, execution means for deriving the significance of the received input signal and for generating at least one display signal in response to execution of at least one of the stored instructions,



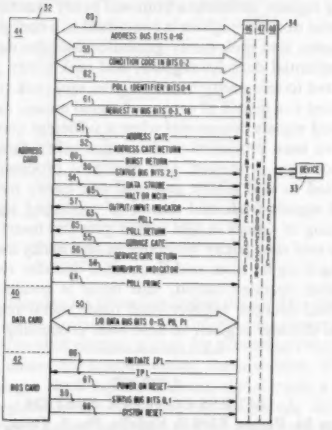
processor register means for providing temporary storage of signals involved in the execution of instructions, processor input means for periodically sampling and for receiving the input signal in response to execution of at least one instruction, and processor output means for outputting the display signal to said display register means in response to execution of at least one instruction.

4,038,641

COMMON POLLING LOGIC FOR INPUT/OUTPUT INTERRUPT OR CYCLE STEAL DATA TRANSFER REQUESTS

Max Abbott Bouknecht; Donall Garraid Bourke, both of Boca Raton, and Louis Peter Vergari, Palm Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,983
Int. Cl.[2] G06F *3/04, 13/00*
U.S. Cl. 364—900 **5 Claims**



1. A peripheral device control unit for use in a data processing system including a central processor unit, storage unit, I/O control logic unit, and an interface (I/F) bus with a plurality of I/F lines for interconnecting and transferring between said storage unit and a peripheral device, under control of instruc-

tions executed by said central processor unit, information, command, control, address, and status signals in parallel between the I/O control logic unit and one or more of said peripheral device control units, and a further I/F line for transferring a poll signal from the I/O control logic unit and one or more of said peripheral device control units in series, certain of the I/F lines transferring to the peripheral device control unit for storage therein, signals indicating an interrupt priority level and poll identifier signals associated with said interrupt priority levels, and certain of the I/F lines including a plurality of interrupt request signal lines for signalling to the I/O control logic unit an interrupt request on a particular one of said interrupt request signal lines associated with the priority interrupt level, said peripheral device control unit comprising:

indicating means for storing and indicating an interrupt request status received from an attached peripheral device;

means responsive to said indicating means for energizing one of the interrupt request lines associated with the priority level stored;

further indicating means for storing a data transfer request status received from an attached peripheral device;

means responsive to said further indicating means for energizing a further I/F line on the interface bus for signalling a cycle/steal (CS) request to the I/O control logic unit;

poll signal receiving means connected to said further I/F line and poll identifier signal receiving means connected to said I/F lines transmitting said poll identifier signals;

means connected and responsive to the stored interrupt priority level and said poll identifier signal receiving means for providing an equal signal;

decode means connected to said poll identifier signal receiving means for providing a CS poll signal; and

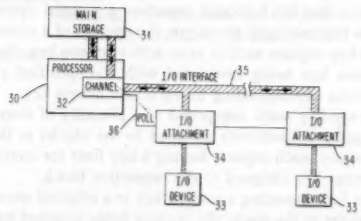
means, connected and responsive to, either said equal signal or said CS poll signal, and said poll signal receiving means for providing a request granted indication to said attached peripheral device.

4,038,642

INPUT/OUTPUT INTERFACE LOGIC FOR CONCURRENT OPERATIONS

Max Abbott Bouknecht; Michael Ian Davis, both of Boca Raton, and Louis Peter Vergari, Palm Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,229
Int. Cl.[2] G06F *3/04, 13/00*
U.S. Cl. 364—900 **11 Claims**



1. A peripheral device control unit for use in a data processing system including a central processor unit (CPU), storage unit, I/O control logic, and an interface (I/F) bus having a plurality of I/F lines for interconnecting the I/O control logic and one or more of said peripheral device control units in parallel, the I/F lines including I/F data lines and I/F address lines for transfer of data and addresses between one or more of said peripheral device control units and the storage unit through the I/O control logic and under control of instructions executed by the CPU, I/F lines from said peripheral device control units to the I/O control logic including a plurality of I/F interrupt request lines, and I/F lines from the I/O control logic to one or more of said periheral device control units including I/F poll identifier lines and a poll signal line connecting said peripheral device control units in series, the storage unit having at addressable locations therein, operate I/O instructions to be fetched and executed by the CPU, peripheral device command information to be transferred through the I/O control logic to said peripheral device control units, and addressable locations for data, each of said peripheral device control units including:

a data register for storing data being transferred between the storage unit and an attached peripheral device;

a command register for storing command information transferred from the storage unit to an attached peripheral device,

device select means for enabling an attached peripheral device; and

device control means for controlling an attached peripheral device including,

first gate means interconnecting said data register and the I/F data lines,

second gate means interconnecting said command register and a first plurality of the I/F address lines,

means interconnecting said device select means and a second plurality of the I/F address lines, said device select means including device address identifying means and responsive to device address signals on the second plurality of I/F address lines to generate, when equal to said device address identifying means, a device select signal, and

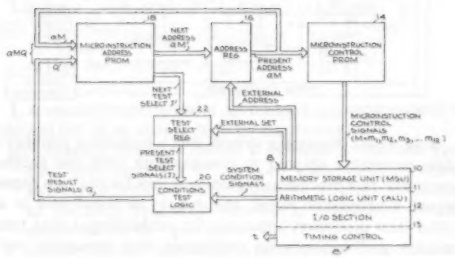
means connected and responsive to said device select signal, for rendering said first and said second gate means effective to transfer data between said data register and said I/F data lines, and to store said command information transferred on said first plurality of the I/F address lines in said command register.

4,038,643

MICROPROGRAMMING CONTROL SYSTEM

Dongsung Robert Kim, Fountain Valley, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 4, 1975, Ser. No. 628,745
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 **17 Claims**



1. In a data processing system, microprogramming control means comprising:

a control memory for storing microinstructions at selectively addressable locations thereof;

an address memory for storing microinstruction addresses at selectively addressable locations thereof;

a first addressing means responsive to a microinstruction read out from said address memory for applying first address data to both said control memory and said address memory;

said control memory being responsive to said first address data for reading out a selected microinstruction for performance by said system; and

additional addressing means responsive to predetermined operations of said system for applying additional address data to said address memory;

said address memory being jointly responsive to said first address data and said additional address data for reading out a microinstruction address from a selected location to said first addressing means for use as a next microinstruction address;

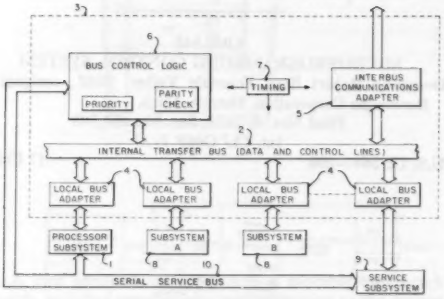
said address memory having microinstruction addresses mapped in the storage locations thereof such that said first address data applied thereto designates a predetermined plurality of storage locations each storing a possible next microinstruction address, while said additional address data determines which one of said predetermined plurality of storage locations is to have its possible next microinstruction address read out therefrom for application to said first addressing means.

4,038,644

DESTINATION SELECTION APPARATUS FOR A BUS ORIENTED COMPUTER SYSTEM

Jack R. Duke, Escondido; Philip W. Brooks, Lakeside, and Robert R. Elzer, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 19, 1975, Ser. No. 633,345
Int. Cl.[2] G06F *3/04, 9/18*
U.S. Cl. 364—900 **8 Claims**



1. In a data processing system which includes a plurality of data processors adapted to communicate with one another, each such data processing including means for issuing a request signal, a destination signal, and data to be transferred to another data processor, apparatus for establishing a data transmission path between an originating data processor and a destination data processor comprising:

a. a common bus;

b. a plurality of local bus adapters corresponding in number to said plurality of data processors, each local bus adapter operatively connected between a respective one of the data processors and the said common bus, each of said local bus adapters including:

1. busy indicator means having first and second states, said first state providing an indication that a data processor coupled to the local bus adapter is busy;

2. means for individually setting its own said busy indicator means and any one of the other of said local bus adapters coupled to said common bus to said first state; and

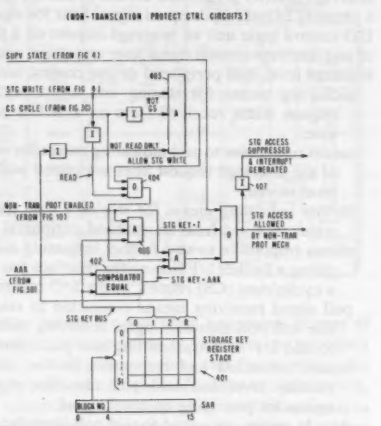
3. means responsive to said first state of the indicator means included therewith for accepting data from said common bus.

4,038,645

NON-TRANSLATABLE STORAGE PROTECTION CONTROL SYSTEM

Richard Eugene Birney, and Michael Ian Davis, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,224
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **6 Claims**



1. A protectable storage system for a main memory comprised of physical blocks, the blocks having respective address sub-ranges within the overall physical address range of the main memory, comprising

key register means having at least in instruction access key register section and an operand access key register section,

storage access request means in a processor for sensing and signalling each type of storage access request made by the processor, the detectable types of request signals including an instruction fetch signal and at least one type of operand access signal, each request signal being for accessing a specified physical address in the main memory, storage request selection means for granting an instruction fetch or operand access request signal to have access to storage,

active key selection means being actuated by a granted instruction fetch request signal or a granted operand access request signal to outgate the content of a corresponding key register section as an active accesss key, the active access key being associated with the specified physical address corresponding to the active access key,

a storage key stack comprised of a plurality of storage key registers respectively assigned to the blocks in the main memory, each register having a key field for containing a storage key assigned to the respective block,

means for outputting a storage key in a selected storage key register in the stack, the register being selected by means of a high-order field in a specified physical address which is the address providing the request signal actuating the active key selection means to outgate the active access key,

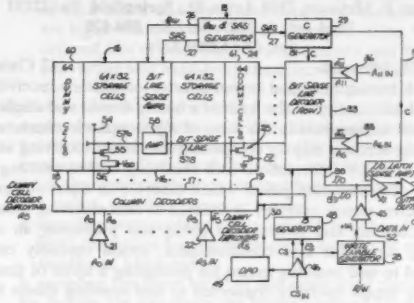
a comparator means comparing the outputted storage key from the selected storage key register with the active access key outputted by the active key selection means to provide a compare-equal signal when the compared keys are equal, and a non-compare signal when they are not equal,

whereby the access at the specified address within a key protected sub-range may be followed if a compare-equal signal is outputted by the comparator means.

4,038,646
DYNAMIC MOS RAM

Rustam Mehta, Sunnyvale, and Stephen F. Dreyer, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 12, 1976, Ser. No. 666,338
Int. Cl.[2] G11C 11/04
U.S. Cl. 340—173 R 24 Claims



1. A dynamic, metal-oxide-semiconductor (MOS), random-access memory (RAM) comprising:

a plurality of storage cells disposed along a plurality of bit-sense lines;

a plurality of bit-sense amplifiers, each of said amplifiers being coupled to one of said bit-sense lines, each bit-sense amplifier including a bistable circuit having a pair of load devices;

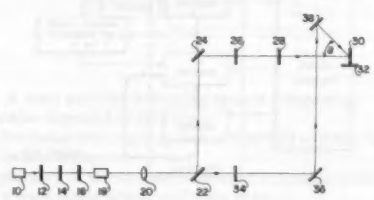
a generator means coupled to said plurality of bit-sense amplifiers for activating said bit-sense amplifiers, said generator means generating an output signal having a first slope for a predetermined period, followed by a second slope at the end of said period, said second slope being greater than said first slope;

whereby said bit-sense amplifiers ae activated in a manner which provides high noise rejection.

4,038,647
METHOD FOR HOLOGRAPHIC STORAGE

Irwin Schneider, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 18, 1976, Ser. No. 659,058
Int. Cl.[2] G11C 11/32, 13/04
U.S. Cl. 340—173 CC 4 Claims



1. A method for improving holographic storage which comprises:

recording an interferogram of a reference wave and an object wave on the ionic crystal with a random distribution of anisotropic centers:

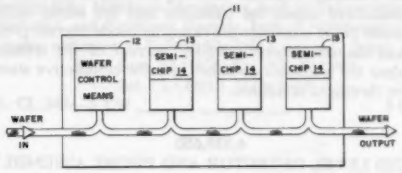
beaming only said reference wave in the erase mode on the crystal; and

beaming only said object wave in the erase mode on the crystal.

4,038,648
SELF-CONFIGURABLE CIRCUIT STRUCTURE FOR ACHIEVING WAFER SCALE INTEGRATION

Gilman D. Chesley, 22431 Starling Drive, Los Altos, Calif. 94022

Filed June 3, 1974, Ser. No. 475,748
Int. Cl.[2] G11C 11/40
U.S. Cl. 340—173 R 13 Claims

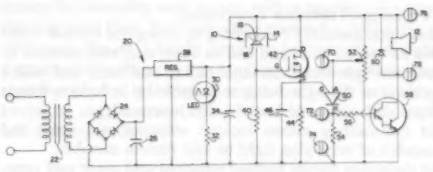


1. In an integrated circuit structure: a semiconductor wafer, a plurality of unit circuits formed on the wafer, input and output lines on the wafer for carrying signals to and from the unit circuits during normal operation of the same, means for applying test signals to the unit circuits via the input lines, and means for sensing the response of each of the unit circuits to test signals and interconnecting the unit circuits with the input and output lines to form a device consisting solely of unit circuits which respond to the test signals in a predetermined manner.

4,038,649
SMOKE DETECTION ALARM DEVICE

John Dobrzanski, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sept. 16, 1975, Ser. No. 613,856
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—237 S 10 Claims



1. A smoke detection alarm device having a stable transition into and out of an alarm condition comprising:

an ionization chamber having a radiation source and two electrodes separated by an open space through which ambient air, ions and smoke may pass, the chamber having an electrical resistance variable in relationship to the smoke within the open space;

a resistive member connected in series with one electrode of the ionization chamber to form with the ionization chamber a first voltage divider having an output at the junction of the resistive member and the one electrode;

a dc power supply connected across the voltage divider formed by the resistive member and the ionization chamber for energizing the chamber whereby smoke entering the chamber varies the chamber resistance and causes a corresponding variation in the output of the voltage divider;

annunciating means responsive to a smoke condition signal for providing an alarm signal; and

threshold circuit means connected between the output of the first voltage divider and the annunciating means for unambiguously detecting transition into and out of an unsafe smoke condition in the chamber and providing to the annunciating means signals corresponding to the smoke condition existing in the chamber, the threshold circuit

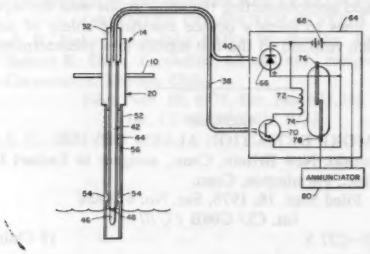
means including a programmable unijunction transistor and a second voltage divider connected across the dc power supply, the gate of the programmable unijunction transistor being connected with the output of one of the voltage dividers and the anode being connected with the output of the other of the voltage dividers to permit the transistor to respond to variations in the resistance of the chamber and determine the threshold condition at which the transistor switches between the non-conductive and conductive states, the transistor and the anode-cathode circuit of the transistor providing an anode current greater than the characteristic valley current of the transistor when the transistor switches into the conductive state at the threshold condition.

4,038,650

FLUID LEVEL DETECTOR AND PROBE ASSEMBLY

Martin Evans, 22216 Victory Blvd., Apt. C-309, Woodland Hills, Calif. 91364, and James H. Kirkendall, 9509 Casaba, Chatsworth, Calif. 91311

Filed Oct. 14, 1975, Ser. No. 621,865
Int. Cl.[2] G08B *21/00*; G02B *5/16*
U.S. Cl. 340—244 R **15 Claims**



1. A fluid level detector comprising:

a fiber optic assembly comprising an elongated fibrous member having an inner end and an outer end, said member to transmit light from said inner end to said outer end with a portion of the light being reflectable by reflection means from said outer end back to said inner end;

light transmitting means located adjacent said inner end capable of supplying light to said fibrous member;

light detection means located adjacent said inner end capable of detecting the reflected light beam from said inner end;

activation means connected to said light detection means, said activation means being capable of assuming an activating position and a deactivating position, upon said light detection means receiving said reflected light said activation means being located in said activating position;

annunciator means connected to said activation means, said annunciator means being actuated with said activation means in said activating position and

a probe to be located within a container and is positioned to be located adjacent the upper surface of a liquid which has previously been established as a known volumetric amount of the liquid, said probe connected to said outer end of said elongated fibrous member, said probe comprising a housing, said fiber optic assembly passing through an opening within said housing and extending exteriorly of said housing, a splash sleeve attached to said housing and located about said fiber optic assembly, said splash sleeve extending beyond the free end of said fiber optic assembly.

9. A fluid level detection probe comprising:

a housing;

a fibrous optic assembly including a fibrous optic member attached to said housing with the free end of said fibrous optic member extending exteriorly of said housing;

a splash guard surrounding the free end of said fibrous optic member, said splash guard being attached to said housing, said splash guard extending past the free end of said fibrous optic member, the interior wall of said splash guard being spaced from said fibrous optic member.

4,038,651

MINIATURE DIGITAL COMMUNICATOR CAPABLE OF DISPLAYING A SERIES OF ALPHA-NUMERIC CHARACTERS

Thomas F. McGraw, 7538 Axton St., Springfield, Va. 22151

Filed July 9, 1975, Ser. No. 594,425
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—336 **17 Claims**

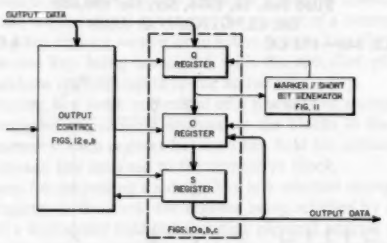
1. A miniature digital communicator capable or receiving digital information in the form of a binary format and displaying said information in the form of alpha-numeric characters rippling across a display comprising means for receiving said digital, binary information, said receiving means emitting a series of information pulses which describe an alpha-numeric character, means operably connected to said receiving means for accepting said information pulses and producing an enabling signal for said communicator, means operably connected to said enabling means for producing a series of timed pulses, means operably connected to said enabling means for producing a reset pulse, means operably connected to said receiving means, said enabling means and said timing means for accepting said information pulses and correlating said timed pulses with the arrival of said information pulses, said correlating means producing a sequential series of pulses, a memory means operatively connected to said correlating means for accumulating said sequential series of pulses, means operatively connected to said memory means for conventing said binary, digital information to alpha-numeric information upon said memory means receiving said reset pulse, means for displaying said alpha-numeric information operatively connected to said converting means and means operatively associated with said communicator for supplying power to said communicator.

4,038,652

DIGITAL COMMUNICATIONS LINE TERMINAL COMPACTER/EXPANDER

Steven J. Schippers, Bellevue, Nebr., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,265
Int. Cl.[2] G06F *3/00*
U.S. Cl. 340—347 DD **12 Claims**



2. A data compacter/expander communications system, comprising:

a communications system;

data compacter means adapted to receive a fixed number of the lower-ordered bits of fixed-level characters and to convert each of said fixed-level characters to corresponding multi-level characters that include said fixed number of the lower-ordered bits of said fixed-level character, and that are then coupled to said communications system, said data compacter means

a. sampling said fixed number of the lower-ordered bits of said fixed-level characters for the presence of an even or odd number of 1 bits, and

b. sampling the bits of said fixed-level character that are higher-ordered than said fixed number of the lower-ordered bits of said fixed-level characters for the presence of all 0 bits

for adding a Short bit 2^S preceding the lowest-ordered bit of said fixed-level characters and deleting only certain of the 0 bits of said bits of said fixed-level character that are higher-ordered than said fixed number of the lower-ordered bits of said fixed-level characters and thereby converting said fixed-level characters to said multi-level characters in response to said sampling procedure;

data expander means coupled to said communications system and adapted to receive said multi-level characters and to convert each of said multi-level characters back to its corresponding fixed-level character, each of which fixed-level characters is then transmitted from said data expander means, said data expander means

a. sampling certain of the lower-ordered bits of said multi-level characters for the presence of an even or an odd number of 1 bits and

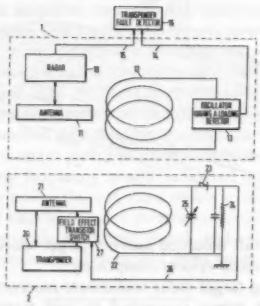
b. sampling the Short bit 2^S of said multi-level characters for forcing the bits above the highest-ordered bit of such multi-level characters to 0 bits to form the like-ordered bits of said fixed-level character and deleting said Short bit 2^S and thereby converting each of said multi-level characters back to its corresponding fixed-level character in response to said sampling procedure.

4,038,653

TRAIN POSITION INDICATOR

Arthur Edward Brewster, Thaxted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,327
Int. Cl.[2] B61L *25/00*; G01S *9/56*
U.S. Cl. 343—6.8 R **6 Claims**



1. A train position indicating system comprising:

a radar disposed in said train;

a first inductive coupling means disposed adjacent said radar in said train;

a plurality of transponders disposed in spaced relation along a track upon which said train runs;

a plurality of second inductive coupling means each disposed adjacent a different one of said plurality of transponders;

first means coupled to said first inductive coupling means to energize said first inductive coupling means; and

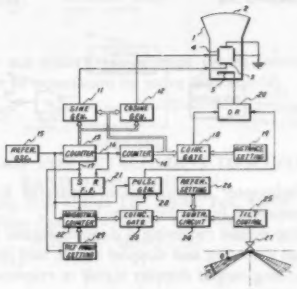
a plurality of second means each coupled to a different one of said plurality of second inductive coupling means responsive to an inductively coupled signal from said first inductive coupling means to enable an associated one of said plurality of transponders to respond to a radar interrogation signal, the others of said plurality of transponders being inhibited from responding to said radar interrogation signal due to the absence of said inductively coupled signal.

4,038,654

INDICATION DEVICE IN PLAN POSITION INDICATION SYSTEM

Masajiro Iida; Hideharu Morimatsu, both of Takarazuka; Itsuo Fukuoka, and Yoshinari Yoshida, both of Nishinomiya, all of Japan, assignors to Furuno Electric Company, Japan

Filed Sept. 12, 1975, Ser. No. 612,906
Int. Cl.[2] G01S *7/22, 9/68*
U.S. Cl. 343—5 EM **3 Claims**



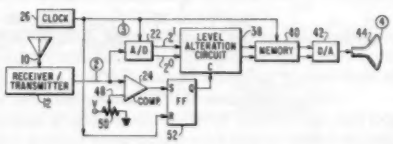
1. An indication device in a plan position indication system including means for transmitting and receiving a spatial wave signal with directivity to and from a specific direction having a preselected tilt angle with respect to a horizontal plane; said device comprising a cathode ray tube including a circular display screen having a fixed reference diameter, scanning means for scanning said screen with a number of concentric circular scan lines, first indicating means for indicating a specific scan line as a bright circle to indicate the straight line distance to the object, second indicating means for indicating a specific radius of said display screen as a bright line, said radius having an angle corresponding to said tilt angle with respect to said reference diameter.

4,038,655

RADAR CONTOUR EDGE RESTORE CIRCUIT

Charles Albert Clark, Jr., Chatsworth, and Roy Atsushi Ito, Woodland Hills, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,984
Int. Cl.[2] G01S *9/60*
U.S. Cl. 343—5 W **4 Claims**



1. In a weather radar of the type providing an iso-contour feature in which only the outline of certain forms are displayed in response to radar returns by sampling said radar returns at a given period to integrate said radar returns into n different light levels for display and where for some sampled radar returnes below some given value a unique one of said n light levels is displayed, the improvement comprising:

means responsive to said radar returns exceeding said given

value for a time less than said period for producing a signal pulse; and

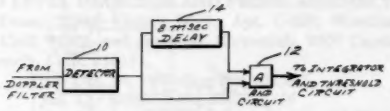
means responsive to said signal pulse altering the display to one of the *n* levels other than said unique level.

4,038,656

HELICOPTER DISCRIMINATION APPARATUS FOR THE MURINE RADAR

John G. Webb, Jr., Sandia Park, N. Mex., and Roger M. Gray, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1974, Ser. No. 456,574
Int. Cl.[2] G01S 7/02
U.S. Cl. 343—5 SA **7 Claims**



1. A helicopter discrimination apparatus for the Murine radar comprising in combination:

detecting means receiving a doppler signal, said detecting means detecting said doppler signal, said detecting means providing output doppler signal in response to said doppler signals:

delay means connected to said detecting means to receive said output doppler signal, said delay means having a predetermined time delay, said delay means delaying said output doppler signal by said predetermined time to provide a delayed doppler signal, said predetermined time delay is 8 milliseconds, and,

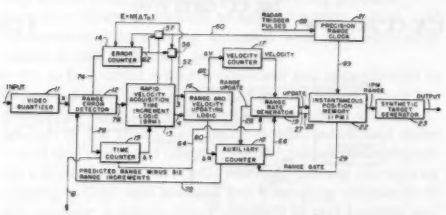
logic control means connected to both said detecting means and said delay means to receive said output doppler signal and said delay doppler signal, said logic control means providing an output signal when said output doppler signal has a time period greater than said delayed doppler signal.

4,038,657

INTERMITTENT RANGE TRACKER

Leslie M. Orloff, Huntington, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 9, 1969, Ser. No. 833,242
Int. Cl.[2] G01S 9/14
U.S. Cl. 343—7.3 **7 Claims**



1. An intermittent data tracking system comprising:

input means for producing a standard width pulse from any length target input pulse;

error detecting means for measuring the distance between said target input pulse and a predicted target range;

an error counter means connected to a first output of said error detecting means;

a time counter means connected to a second output of said error detecting means;

a first binary rate multiplier for performing range acquisition and time increment logic having three inputs, said first input connected to said error counter, said second input connected to said time counter and said third input connected to a third output of said error detecting means;

range and velocity updating logic means connected to said first binary rate multiplier having a first output connected to a velocity counter and a second output connected to an auxiliary counter;

a second binary rate multiplier connected between the outputs of said velocity and auxiliary counters, a first output of said second binary rate multiplier being connected to the input of said auxiliary counter;

a digital storage and readout means connected to a second output of said second binary rate multiplier;

means for supplying synchronizing signals to said digital storage means; and

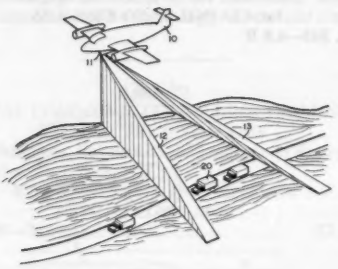
a target generating means connected to said storage and read-out means to produce a synthetic radar pulse representative of the target input signal.

4,038,658

MOVING TARGET SPEED AND DIRECTION DETERMINING RADAR SYSTEM

John L. Nelson, and Douglas G. Trego, both of Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 13, 1972, Ser. No. 314,881
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 **6 Claims**



1. An aircraft mounted moving target speed and direction determining radar system comprising:

a. a moving target radar transmitter-receiver means;

b. antenna means connected to said transmitter-receiver means for providing two radar beams at an angle to each other;

c. mounting means for affixing said antenna means to such aircraft with the two radar beams directed outwardly to the side of the vehicle relative to the normal direction of movement of the vehicle;

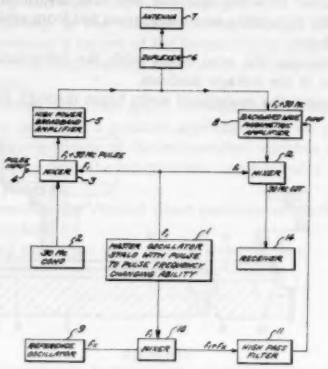
d. one of said radar beams being directed angularly ahead of a line perpendicular to said normal direction and the second of said two radar beams being directed angularly behind said perpendicular line; and

e. means for providing individually identifiable visual indications of a target relative to its surrounding interrupting each of said beams to indicate the distance and direction the target has moved between interruptions of the two beams, said visual indications means being connected to said transmitter-receiver means for receiving signals therefrom.

4,038,659
FREQUENCY AGILITY RADAR

Edward G. Hamer, Baltimore, and Calvert F. Phillips, Jr., Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 9, 1966, Ser. No. 578,935
Int. Cl.[2] G01S 7/28
U.S. Cl. 343—17.1 R **2 Claims**



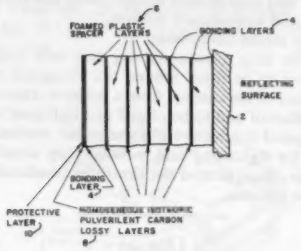
1. A frequency agility radar system comprising a first oscillator having a predetermined frequency range, said first oscillator generating a first output signal with the frequency thereof selected in a random manner, a second oscillator generating a second signal having a preselected frequency, first pulsed mixer means receiving said first and second signals and providing an upper sideband pulsed output signal, means to transmit said upper sideband pulsed output signal toward preselected targets to provide return echo signals therefrom, a backward wave parametric amplifier, means to feed said backward wave parametric amplifier said return echo signals, means for tuning said backward wave parametric amplifier automatically to follow the transmitted signal frequency, said automatic tuning means including a third oscillator generating a third signal of preselected frequency, second mixer means receiving said first signal and said second signals, means to filter the output signal from said second mixer means to provide only the upper sideband signal pump frequency to said backward wave parametric amplifier for tuning thereof, third means to mix the output signal from said backward wave parametric amplifier and said first signal to provide an output signal, and receiver means being fed the output signal from said third mixer means.

4,038,660
MICROWAVE ABSORBERS

Thomas M. Connolly, Canton, and Eino J. Luoma, Norwood, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1975, Ser. No. 602,168
Int. Cl.[2] H01Q 17/00
U.S. Cl. 343—18 A **2 Claims**

1. In a microwave absorber of the type including a plurality of partially conductive lossy layers, whose conductivity increases from front layer to back layer, separated by intermediate dielectric spacing layers all bonded together to form a Jaumann microwave absorber, the combination of spacing layers having a thickness not greater than one-fourth of the wavelength at the higher frequency, such that the total thickness of the absorber is at least one-half of the wavelength at the lowest frequency of the range to be absorbed, with lossy layers having a homogeneity and isotropy such that average admittance values determined at a plurality of points in one degree of

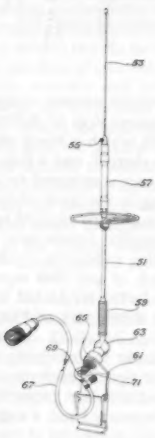


orientation do not differ from average values determined in another degree of orientation by more than ±0.02.

4,038,661
TUNING LOOP FOR ATTACHMENT TO A CITIZENS BAND RADIO ANTENNA

Charles P. Nolte, Rte. 1, Box 129, Aledo, Tex. 76008

Filed Jan. 2, 1976, Ser. No. 646,385
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 **11 Claims**



1. A device adapted to be attached to an omni-directional mobile antenna for a radio having an elongated conductive element, comprising:

adjustable metallic clamp means adapted to be coupled to the elongated conductive element, and

a bendable metallic member having a generally planer loop-shaped portion generally surrounding said clamp means with at least one end portion extending inward from the loop and fixedly connected to said clamp means,

said portion of said metallic member which forms said loop-shaped portion being coiled such that it defines an angle greater than 360°,

said one end portion being connected to said clamp means such that when said clamp means is coupled to the elongated conductive element of the antenna, said loop-shaped portion surrounds the elongated conductive element of the antenna and is located in a plane generally perpendicular to the elongated axis of the eleongated conductive element of the antenna.

said inward extending end portion between said loop-shaped

portion and said clamp means being generally in the same plane as that of said loop-shaped portion,

the dimension of said device in a plane perpendicular to the pane of said loop-shaped portion being less than the diameter of said loop-shaped portion,

said clamp means comprising:

a metallic loop member having two ends adapted to be opened to be fitted around the elongated conductive element of the antenna from a position transverse to the axis thereof and to be closed and tightened around the elongated conductive element of the antenna, and

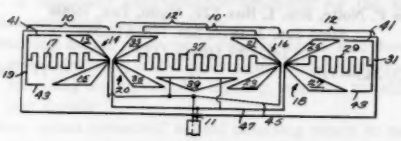
means for tightening said metallic loop member of said clamp means around the elongated conductive element of the antenna.

4,038,662

DIELECTRIC SHEET MOUNTED DIPOLE ANTENNA WITH REACTIVE LOADING

Edwin M. Turner, Dayton, Ohio, assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Oct. 7, 1975, Ser. No. 620,501
Int. Cl.[2] H01Q 9/16
U.S. Cl. 343—752 **12 Claims**



1. A broadband television antenna comprising a substrate formed of a thin, elongated strip of dielectric material, said substrate having a width which is many orders of magnitude smaller than the length thereof, and a thin, elongated electrically small conducting means mounted on said substrate, said conducting means being in the form of an interlaced dipole array, each dipole having a first tapered conductive radiator for receiving electromagnetic signals over a broad frequency band, an inductive loading undulating conductor connected at one end thereof to each of said first tapered conductors, a capacitive loading conductor connected to the other end of each of said undulating conductors, said inductive and capacitive loading conductors increasing the effective electrical length of said dipole array for receiving relatively low frequency electromagnetic signals, each dipole having a second tapered conductive radiator for receiving electromagnetic signals over a broad frequency band, a second inductive loading undulating conductor connected at one end of one of said second tapered conductors and at the other end to the other of said second tapered conductors of another dipole of said dipole array, said second undulating conductor increasing the effective electrical length of each of said first and second tapered dipoles, and means for connecting said dipoles to an output terminal.

4,038,663

METHOD OF WRITING INFORMATION WITH A MODULATED RADIATION BEAM ONTO AN INFORMATION STORAGE MEDIUM AND INFORMATION STORAGE MEDIUM PARTICULARLY ADAPTED TO THE METHOD

Paul Edwin Day, Eindhoven, Netherlands, and George Churchill Kenney, Stamford, Conn., assignors to U.S. Philips Corporation and North American Philips Corporation, both of New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,881
Int. Cl.[2] G01D 15/32
U.S. Cl. 346—1 **6 Claims**

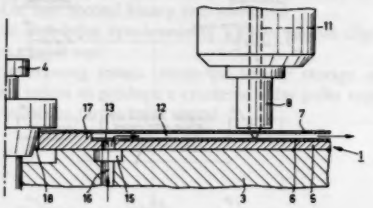
1. A method for writing information with an information modulated radiation write beam onto a radiation sensitive information layer provided on at least one face of an information storage medium, the information being stored in the information layer by local changes in the physical properties of the information layer, the method comprising the steps of:

a. providing a write-beam-transparent flexible foil attached to at least part of said information storage medium and in clinging relationship to said information layer prior to recording,

b. immediately prior to writing said information providing a gas layer between said foil and said information layer, thereby separating said transparent foil from said information layer,

c. modulating the read beam with the information to be stored in the storage medium,

d. focussing the modulated write beam through the protective foil and through said gas layer onto said information layer,



e. moving the write beam in relation to the storage medium and the protective foil in order to write information tracks in said information layer,

f. maintaining said gas layer between said transparent foil and said information layer throughout said writing process, and

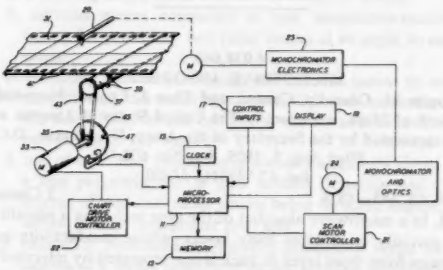
g. exhausting said gas from between said foil and said information layer subsequent to said writing process to reestablish said clinging relationship between said foil and said information layer, thereby protecting said information layer from dust contamination both prior and subsequent to writing, while providing a gas-filled space abutting said information layer during the writing process to permit by-products of the writing process to pass freely from said information layer.

4,038,664

RECORDING CHART LOCK

Andrew Redvers Muir, High Wycombe, England, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed July 1, 1976, Ser. No. 701,719
Int. Cl.[2] G01D 9/00, 15/24; B65H 17/26
U.S. Cl. 346—1 **12 Claims**



1. In an analytical instrument in which a sample under test is analyzed over a continuous range of at least one input variable, with the response of said sample plotted as the ordinate value and the change of variable as the abscissa value on an asso-

ciated chart recorded having a sprocket drive, said instrument having associated therewith a microcomputer including a microprocessor, a read only memory, a random access memory, and input/output facilities, the microcomputer at all times having stored therein the instantaneous value of the independent variable, the chart paper having graduated grid lines thereon corresponding to various independent variable values, a method of synchronizing said instrument and said chart recorded to obtain correspondence between said independent variable and said chart lines comprising:

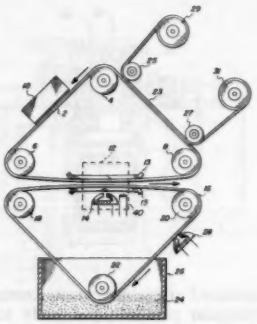
a. maintaining in the random access memory of the microcomputer a record of the instantaneous position of the chart drive, representing the current position of the drive sprockets;
b. positioning the chart paper on which recording is to be carried out on at a position approximating the grid position corresponding to the independent variable value;
c. calculating from the independent variable value a desired chart position;
d. differencing the desired chart position and actual chart position; and
e. moving said chart until said difference is zero.

4,038,665

RECORDING WITH DONOR TRANSFER OF MAGNETIC TONER

Armand P. Neukermans, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1975, Ser. No. 616,969
Int. Cl.[2] G03G *19/00*
U.S. Cl. 346—74.1 **26 Claims**



1. A method for developing a latent magnetic image on a magnetizable copy surface comprising the steps of:

forming a magnetic latent image on said magnetizable copy surface by alterating patterns of magnetization of a first spatial wavelength;

providing a magnetizable donor surface;

uniformly magnetizing said donor surface in alternating patterns of magnetization of a second spatial wavelength, whereby said first magnetization pattern produces a magnetic field stronger than said second magnetization pattern;

attracting magnetic toner to the alterating magnetization pattern of said donor surface;

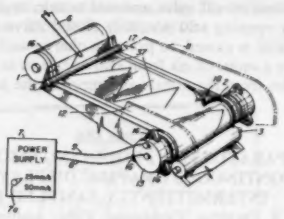
transporting said donor surface substantially uniformly laden with said magnetic tonor into non-cnducting proximity with said copy surface, whereby said toner is transferred from said donor surface to said image area of the copy surface under the influence of the stronger magnetic field of the image area.

4,038,666

PORTABLE MEDICAL DATA RECORDER

Henry Edward Fuller, Jr., Stow, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1975, Ser. No. 636,005
Int. Cl.[2] G01D *15/24, 9/00*; H02K *7/00*
U.S. Cl. 346—136 **5 Claims**



1. A portable medical data strip chart recorder comprising:

a supply roller on which the strip chart is stored;

a platen across which the strip is drawn at a predetermined linear velocity and tension; and

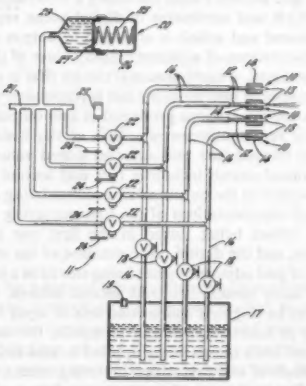
drive roller means for drawing the strip across the platen including integral motive means for rotating the roller means at a selected angular velocity, the drive roller means including a hollow shaft about which is affixed a concentric cylinder pad member of selected durometer, DC motor means mounted internally and concentrically of the shaft and affixed thereto having a DC motor axially aligned with a gearbox of selected ratio for providing the selected angular velocity and wherein the DC motor stator is affixed to the drive shaft and the rotor held stationary thereby causing the shaft and stator to rotate about the rotor at the selected angular velocity, the recorder includes a frame member to which the rotor is affixed and bearing members mounted to the frame in which marginal ends of the shaft are mounted, and a DC power source energizes the DC motor through brush means contacting means on one of the bearing members.

4,038,667

INK JET INK SUPPLY SYSTEM

Shou L. Hou, and Robert D. Carnahan, both of Barrington, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 28, 1976, Ser. No. 681,338
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **2 Claims**



1. In an ink jet writing device including a droplet forming

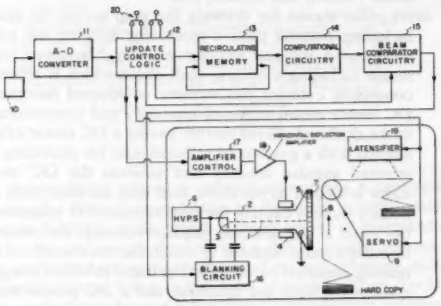
nozzle, a transducer for ejecting ink droplets from said nozzle and a capillary conduit for conveying ink from a reservoir to said nozzle, the combination comprising, an on-off valve interposed in said conduit for selectively blocking said nozzle from said reservoir thereby allowing the nozzle to be vacuum primed and, once primed, to trap ink in the nozzle during shipping and storage, a second source of ink under pressure connected through a normally closed valve to said conduit between said on-off valve and said nozzle, and means for intermittently opening said normally closed valve so as, when said on-off valve is closed, to pressure charge said nozzle with ink and drive a squirt of ink from said nozzle so as to clear any dirt or bubbles from the nozzle and reprime the jet.

4,038,668

APPARATUS FOR PRODUCING SMOOTH AND CONTINUOUS GRAPHIC DISPLAYS FROM INTERMITTENTLY SAMPLED DATA

William T. Quarton, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 31, 1975, Ser. No. 627,794
Int. Cl.[2] G06G 7/30
U.S. Cl. 235—151 **2 Claims**



1. Apparatus for producing a display of the condition of a signal comprising,

a display means having a display medium,

first means connected to the source of the signal for producing a succession of digital value representations,

each of which represents a successive condition of the signal, and

second means connected to said first means to derive from consecutively derived ones of said digital values other digital values intermediate of said consecutively derived ones said second means including a recirculating memory in which said succession of digital value representations are stored and which is arranged to output digital value representations of adjacent stored values of the condition of the signal, a computational circuit that is connected to the output of said memory and is responsive to the digital value representations produced at said output to produce digital representations of values of the condition of the signal intermediate said adjacent stored values, said computational circuit including first and second latch means connected to the output of said recirculating memory, the digital representations of the first occurring of said adjacent values being stored in the first one of said latch means, and the digital representation of the second occurring of said adjacent values being stored in a second one of said latch means, first and second adders, each of said adders having first and second sets of input terminals and a set of summation output terminals, the output of said second latch means being applied to said first set of input terminals of said first adder, inverting means, the output of said first latch means being connected through said inverting means to said second set of input terminals of said first adder, the summation output terminals of said first adder being connected to said first set of input terminals of said second adder, a data selector having first and second sets of input terminals and a set of output terminals, connections from the output of said first latch means to said first set of input terminals of said data selector, a connection from the summation output terminals of said second adder to said second set of input terminals of said data selector, an accumulator having input terminals and output terminals, a connection from the output terminals of said data selector to the input terminals of said accumulator, and a connection from the output of said accumulator to said second set of input terminals of said second adder and

third means includes a digital comparator connected to the output of said data selector of said computational circuit, said digital comparator being operative to respond to the digital representations produced by said computational circuit to provide a succession of control signals, and display means controlled by said control signals to produce substantially parallel lines on said display medium,

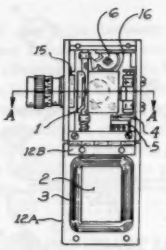
each of said lines being individually representative of a related one of said consecutively derived ones and said other values, all of said lines being substantially continuous and extending in their aggregate length between two points, the positions of which represent, respectively, a corresponding two, consecutively derived ones, of said values.

4,038,669

CRYOGENIC CAMERAS

John Michael Guerra, 186 Waltham St., W. Newton, Mass. 02165

Filed Mar. 27, 1975, Ser. No. 562,948
Int. Cl.[2] G03B 29/00
U.S. Cl. 354—76 **1 Claim**



1. A self-contained cryogenic camera comprising a hollow Plexiglas rectangular parallelopiped body having a central aperture on a frontplate of said body, a tube and collar assembly attached to said frontplate over said aperture, an entrance slot in the side of said body into which a filmholder is inserted, a hinged Plexiglas back to which is attached an aluminum insulated refrigeration chamber with fittings for the refrigerant entrance and proper ventilation, said back assembly being attached by hinge to the back of said camera body, a sealed film chamber formed by said filmholder and a portion of said body when said hinged back is closed and secured thereby keeping out moisture, a silica gel absorption packet and holder within the said film chamber for absorbing moisture within the sealed film chamber and thereby preventing frosting of the film surface and optical window, a reflex-type off-axis optical guide system contained within said film chamber for directing the image being photographed, an illuminated optical Plexiglas reticle comprising a piece of optical Plexiglas having etched cross-hairs on the surface of the optical Plexiglas and having an LED imbedded in the optical Plexiglas, said Plexiglas rectangular parallel body having an eyepiece aperture on top of the body, said optical Plexiglas reticule being cemented to the inside top of the said body so as to cover the eyepiece aperture, an eyepiece cemented into the said eyepiece aperature so as to

protrude from the top of the said body, a penlight-cell power supply and potentiometer switch contained within the said film chambr for powering the said LED, said refrigeration chamber being able to accept any refrigerant material, the refrigeration of the film occurring through thermal conduction by pressure of the aluminum refrigeration chamber against the back of the filmholder, said reflex-type optical guide system including a spring-action rod, collar and bearing assemble the said rod being supported by a plexiglas bearing that is cemented to the inside of the hinge wall of the said body, said bearing having a round head tack inserted into the face of said bearing, a shaft collar with notches drilled into the face of said shaft collar at an angle of 45° apart to accept said round head tack, said rod protruding through the wall opposite to the said hinge wall of the said body, a helical spring on said rod compressed between the said opposite wall and another shaft collar on said rod, said compressed spring causing the rod and notched shaft collar assembly to lock on the said round head tack in two positions 45° apart, a first surface mirror cemented midway along the said rod, said mirror so positioned to lock at a 45° and 0° angle from the top of the said body, said mirror intercepts a portion of the light entering the aperature on the frontplate when said mirror is in the 45° position.

4,038,670

PANORAMIC PICKUP CAMERA

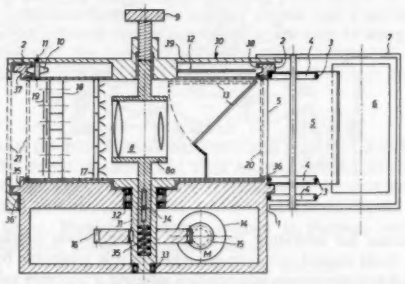
Hermann Seitz, Niederwangen, Switzerland, assignor to Infra-Vision Ltd. Zug, Schaffhausen, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,448

Claims priority, application Germany, Mar. 11, 1974, 2411537

Int. Cl.[2] G03B *37/00, 37/02*

U.S. Cl. 354—96 **8 Claims**



1. In a panoramic pickup camera for producing pictures with randomly large viewing angles which may exceed 360°, wherein at the moment of light exposure the film is stationary, having a support, a camera structure containing the objective and rotatable relative to the support, and a film container and a film guide having a substantially cylindrical arched portion, the radius of which is equal to the focal length of the objective, the improvement comprising: the camera structure containing spaced from the objective the film container, said camera structure incorporating a housing enclosing the objective, the film guide including a ring positioned on the side of the housing which is situated opposite the support, said ring being freely rotatable respective to the camera structure, said support possessing a substantially cylindrical configuration, a first substantially cylindrical circumferential surface provided on said cylindrical support, said ring possessing a second substantially cylindrical circumferential surface, the film being held under contact at its one edge against the first cylindrical circumferential surface of the support and at its other edge against the second cylindrical circumferential surface of the ring.

4,038,671

PHOTOGRAPHIC APPARATUS WITH TWO PICTURE TAKING LENSES

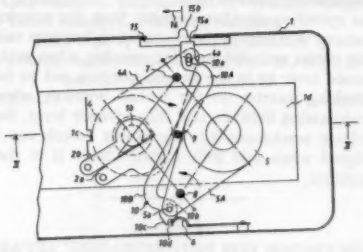
Rolf Schroder, Baldham, and Reinhard Nicko, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 20, 1976, Ser. No. 716,297

Claims priority, application Germany, Aug. 29, 1975, 2538426

Int. Cl.[2] G03B *3/00, 13/02*

U.S. Cl. 354—197 **10 Claims**



1. In a photographic apparatus, a combination comprising a housing; means defining a light-admitting aperture in said housing; first and second picture taking lenses; first and second pivots mounted in said housing in parallelism with the optical axes of said lenses, said first and second lenses respectively having first and second mounts movable about the axes of said first and second pivots between first and second positions in which said first and second lenses respectively register with said aperture; and means for moving said mounts, including a displacing member, pivot means for said displacing member, said pivot means being mounted in said housing intermediate said first and second pivots, and first and second motion transmitting means respectively coupling said displacing member with said first and second lens mounts.

4,038,672

INTERLOCKING DEVICE FOR A CAMERA

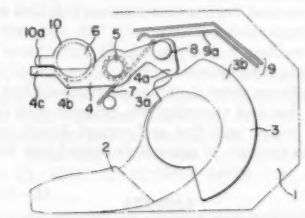
Hidenobu Kondo, Yokohama, and Yoshiyuki Nakano, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 604,032

Claims priority, application Japan, Aug. 23, 1974, 49-100233[U]

Int. Cl.[2] G03B *17/38*

U.S. Cl. 354—212 **4 Claims**



1. In a device for a camera wherein the operation of a shutter release mechanism is blocked and a power switch is opened when a film advance lever is in a position housed in a camera body, and the blocking of said shutter release mechanism is released and the power switch is closed when said film advance lever is in a preparatory position extending out of the camera body a predetermined distance without having advanced the film; the improvement which comprises:

a. a working member engageable with both said shutter

release mechanism and the power switch, and movable between a first position in which the working member blocks the operation of said shutter release mechanism and opens the power switch and a second position in which the working member releases said blocking and closes the power switch;

b. means for actuating said working member in coordination with said film advance lever to the first position when the film advance lever is in the housed position and to the second position when the film advance lever is in the preparatory position; and

c. an operating member operable from the exterior of said camera to interrupt the cooperation between said actuating means and said working member when said film advance lever in in the housed position and to move said working member to the second position, whereby the cooperation between said film advance lever, the shutter release mechanism and the power switch can be interrupted when said film advance lever is in the housed position.

4,038,673

VIEW FINDER FOR PHOTOGRAPHIC APPARATUS UTILIZING OBJECTIVES HAVING DIFFERENT FOCAL LENGTHS

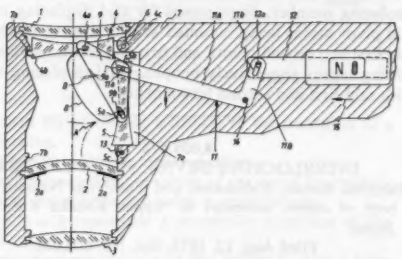
Rolf Schroder, Baldham, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 20, 1976, Ser. No. 716,182

Claims priority, application Germany, Aug. 30, 1975, 7527515[U]

Int. Cl.[2] G03B *13/02, 13/10*

U.S. Cl. 354—222 **10 Claims**



1. In a photographic apparatus for use with objectives of different focal length, a view finder comprising a field lens for admission of scene light; first and second intermediate lenses disposed behind said field lens; fixed first and second pivots for said first and second intermediate lenses; a link; first and second articulate connections between said link and said first and second intermediate lenses, one of said connections constituting a pin-and-slot connection; and means for pivoting said intermediate lenses through the medium of said link about the axes of said first and second pivots between first and second positions in which said first and second lenses respectively extend across the path of scene light behind said field lens.

4,038,674

SHOCK INHIBITING ARRANGEMENT FOR LATCHED SHUTTER BLADE MECHANISM

George D. Whiteside, Lexington, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 25, 1976, Ser. No. 699,677

Int. Cl.[2] G03B *9/08*

U.S. Cl. 354—230 **11 Claims**

1. A photographic camera having means for mounting photographic film material at a given focal plane, said camera comprising:

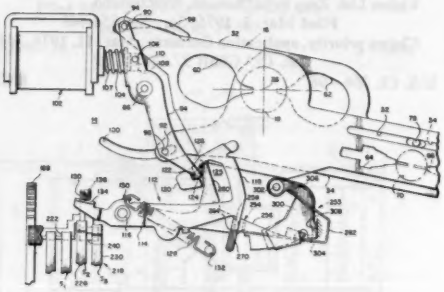
a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plant and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

drive means actuable for displacing said blade mechanism between its said arrangements;

latch means for initially retaining said blade mechanism in one of its said arrangements;

means at least in part electrically energizable for actuating said drive means to effect the displacement of sald blade mechanism from its said arrangement wherein it is retainable by said latch means to another of its said arrangements and then back to its said arrangement wherein it is retainable by said latch means to define an exposure cycle of said blade mechanism, said latch means being structured for displacement responsive to said actuation of said drive means to effect its normal release of said blade mechanism facilitating the movement of said blade mechanism under the influence of said drive means to define said exposure cycle and said blade mechanism also being structured to be responsive to a sudden shocking thereof for movement from its said arrangement wherein it is retainable by said latch means into a position wherein it becomes released from said latch means; and



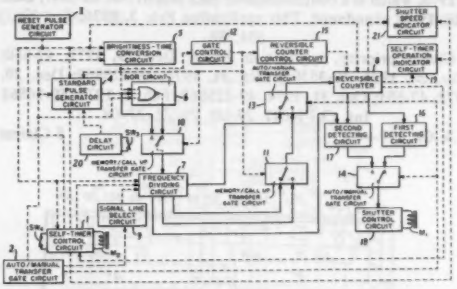
means for inhibiting movement of said blade mechanism from its said arrangement wherein it is retainable by said latch means into said position wherein it becomes released from said latch means in response to the sudden shocking thereof, said inhibiting means including a first moveable element disposed for displacement between a first arrangement wherein it is engageable by said blade mechanism when said blade mechanism is retained by said latch means serving to preclude the displacement of said blade mechanism from its operative association with said latch means and a second arrangement wherein it will not preclude the unlatching of said blade mechanism from said latch means thereby facilitating normal film exposure operations of said camera, and means for precluding said first moveable element from being displaced from its said first arrangement into its said second arrangement under the influence of a sudden shocking of said camera, said inhibiting means including a shock sensitive mechanism structured and arranged to respond to a sudden shocking of said camera to move from an initial position outside of the path of displacement of said first moveable element into said path of displacement of said first moveable element before said first moveable element has responded to the sudden shocking of said camera to move into its said second arrangement.

4,038,675

SYSTEM FOR INDICATING THE OPERATION OF A SELF-TIMER IN AN ELECTRIC SHUTTER FOR CAMERA

Kiyoshi Kitai, Tokyo; Takeo Saito, Yotsukaido, and Youichi Seki, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Mar. 14, 1975, Ser. No. 558,356
Claims priority, application Japan, Mar. 14, 1974, 49-28546
Int. Cl.[2] G03B 9/64
U.S. Cl. 354—238 3 Claims



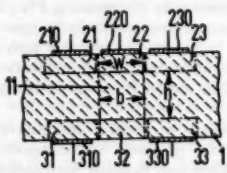
1. A system for indicating the operation of a self-timer in an electric camera shutter of the type having a digital recording and reproducing system operable in a self-timer mode for counting and memorizing in a counter circuit a number of pulses produced from a pulse generator circuit, said number of pulses corresponding to the brightness of a subject to be photographed: means for controlling the exposure time in response to the triggering of a camera shutter release member according to the memorized content of said counter circuit and for controlling, in the case of using a self-timer, the operative period of the self-timer by frequency dividing the pulse output of said pulse generator through said counter circuit; and a self-timer operation indicator circuit controlled at the time of using the self-timer by the frequency division pulse output of said counter circuit for indicating operation in the self-timer mode.

4,038,676

PAIR OF BIPOLAR TRANSISTORS HAVING BASE ZONES WHICH ARE ELECTRICALLY CONDUCTIVELY CONNECTED TO ONE ANOTHER, AND A PROCESS FOR PRODUCING THE PAIR OF TRANSISTORS

Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 21, 1975, Ser. No. 634,038
Claims priority, application Germany, Dec. 19, 1974, 2460269
Int. Cl.[2] H01L 29/72, 29/48, 29/56, 29/64
U.S. Cl. 357—34 9 Claims



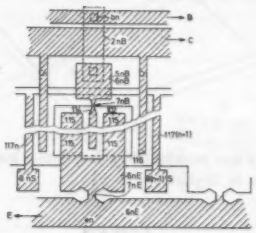
1. A transistor arrangement comprising:
a semiconductor substrate,
a pair of lateral bipolar transistors superposed and spaced apart in said substrate,
each of said transistors including a base zone, an emitter zone and a collector zone superposed with the like zones of the other transistor, at least said base zone of each transistor being a doped zone in said substrate and each of said base zones electrically conductively connected together,
each of said base zones having a free boundary face line opposite the like face of the other base, and
a doped connection zone in said substrate of the same type of doping as said base zones extending between and connecting said base zones.

4,038,677

COMPOSITE SEMICONDUCTOR UNIT AND METHOD

Karl Nagel, Gomaringen; Gerhard Conzelmann, Leinfelden, and Horst Gschwendtner, Esslingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 7, 1975, Ser. No. 548,068
Claims priority, application Germany, Feb. 22, 1974, 2408540
Int. Cl.[2] H01L 27/02, 29/06
U.S. Cl. 357—51 24 Claims



1. Composite semiconductor unit comprising on a common substrate:
a plurality of substantially similar semiconductor elements each containing at least one p-n junction and having a plurality of electrodes, and
circuit means in said unit for connecting the similar electrodes of all said elements, except those found to be defective as hereinafter stated, effectively in parallel through branches leading to said respective electrodes, all of said branches related to each set of similar electrodes being connected together by a common lead conductor path, said circuit means including, in each of said branches respectively related to the electrodes of at least one set of similar electrodes, means for facilitating detection of whether the semiconductor element connected to the branch in question is defective and means for facilitating severing of the branch, at least one branch so equipped related to each defective semiconductor element, if any, being severed at said severance facilitation means thereby to disconnect said defective element from the others.

4,038,678

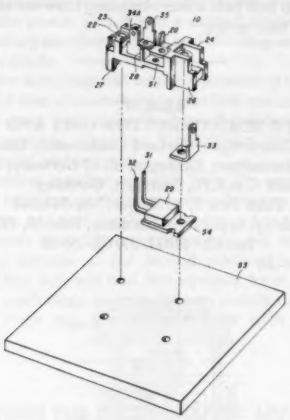
POWER TRANSISTOR AND THYRISTOR ADAPTER

Thomas Leon Gottbreht, Plano; James William Tolson, Garland, and Joe Wade Crawford, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,235
Int. Cl.[2] H01L 23/02, 39/02; H02B 1/04, 1/00
U.S. Cl. 357—81 9 Claims

1. A universal adapter, for mounting on a planar surface, to which one of various types of power transistors and thyristors may be attached, comprising:
a. a body having at least one mounting pedestal connected to its lower surface to provide a power transistor or thyristor accepting cavity, a plurality of lead apertures to accommodate the various types of power transistors and thyristors communicating between the lower and upper surfaces; and
b. a plurality of electrical contacts for connection to exterior

electrical circuits, mounted on the upper surface of the body member, each positioned at a selected one of the lead



apertures and attached to a respective lead of the power transistor or thyristor.

4,038,679

APPARATUS FOR READING AN OPTICALLY RECORDED RECORD CARRIER PROVIDED WITH PERIODIC SURFACE UNDULATIONS AND FOR DERIVING A FOCUSSING CONTROL SIGNAL FROM SUCH SURFACE UNDULATIONS

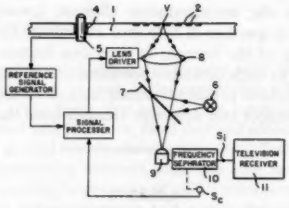
Gijsbertus Bouwhuis, and Christiaan Hendriks Frans Velzel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 464,841, April 29, 1974. This application Oct. 29, 1975, Ser. No. 626,618

Claims priority, application Netherlands, Feb. 14, 1974, 7402012

Int. Cl.² H04N *5/76*

U.S. Cl. 358—127 **1 Claim**



1. An apparatus for reading a record carrier, said record carrier having periodic surface excursions in the thickness directions of said carrier, the spatial frequency of the excursions along the direction in which the tracks are read being lower than the spatial frequency of said areas and intermediate areas, said apparatus comprising a radiation source supplying a read beam nominally focussed on said tracks, a radiation-sensitive detector for converting the read beam, modulated by the sequence of areas and intermediate areas of a track and by said excursions into an electrical signal, signal frequency separator means connected to said detector for deriving from the detector signal a high-frequency and a low-frequency signal component, means for processing the high-frequency signal component to an information signal, means for converting the low-frequency component into a control signal, and means responsive to said control signal for correcting the read beam focussing.

4,038,680

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

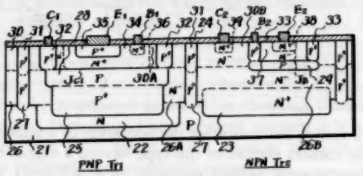
Hajime Yagi, Tokyo, and Tadaharu Tsuyuki, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 561,914, March 25, 1975, which is a continuation-in-part of Ser. No. 427,648, Dec. 26, 1973, abandoned, and a continuation-in-part of Ser. No. 620,293, Oct. 7, 1975, which is a continuation-in-part of Ser. No. 427,647, Dec. 26, 1973, abandoned. This application Feb. 3, 1976, Ser. No. 654,758

Claims priority, application Japan, Dec. 29, 1972, 47-550; Mar. 28, 1974, 49-35307; Oct. 31, 1974, 49-125869; Dec. 29, 1972, 47-551; Oct. 31, 1974, 49-125868; Feb. 8, 1975, 50-16561

Int. Cl.² H01L *27/02, 29/72, 27/04*

U.S. Cl. 357—44 **5 Claims**



1. A semiconductor integrated circuit having first and second transistors of opposite conductivity type, comprising:

a. a semiconductor substrate of a first conductivity type;

b. an epitaxial layer formation of a second conductivity type and relatively low impurity concentration formed on said substrate and having a major face opposite the substrate;

c. said first transistor comprising:

i. a first region of first conductivity type in said epitaxial layer of formation spaced below said major face, and a conductive path region of first conductivity type and higher impurity concentration than said first region extending from the first region up to the major face;

ii. a second region of second conductivity type being formed of said epitaxial layer formation and partially surrounded by said first region and conductive path region; and

iii. a third region of first conductivity type formed in said second region spaced from said first region by said second region;

d. an isolating PN junction between said first transistor and said second transistor, said second transistor comprising:

i. a fourth region of second conductivity type formed of a portion of said epitaxial layer formation isolated from the first transistor by the isolating PN junction;

ii. a fifth region of first conductivity type spaced below said major face; and a conductive path region of first conductivity type and higher impurity concentration than said fifth region from the fifth region up to the major face;

iii. a sixth region of second conductivity type being formed of said relatively low concentration epitaxial layer formation and partially surrounded by said fifth region and conductive path region, said sixth region being spaced from said fourth region by said fifth region; and

iv. a seventh region of second conductivity type and concentration relatively higher than said sixth region formed in said sixth region and forming a low-high concentration barrier junction therewith, said junction being spaced from said fifth region by a distance less than the diffusion length of minority carriers in said sixth region injected from said fifth region when a

forward bias is applied between said fifth and sixth regions;

whereby a first transistor is formed in an integrated circuit with a second transistor of low emitter concentration.

4,038,681

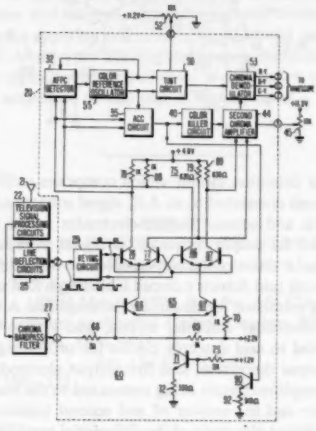
CHROMA-BURST SEPARATOR AND AMPLIFIER

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,289

Int. Cl.[2] H04N 9/46

U.S. Cl. 358—20 **11 Claims**



1. Electronic signal processing apparatus for separating and amplifying burst and chroma signal components of a periodic color television composite chrominance signal including a color reference burst signal component and a chroma information signal component respectively occuring during first and second predetermined intervals of the period of said composite signal, comprising:

differential amplifier means having at least one input terminal and first and second antiphase output terminals, said amplifier means being responsive to composite signals applied to said input terminal for producing amplified antiphase composite signals at said output terminals;

first gating means comprising first and second current conducting devices each having a gating input terminal, a signal input terminal and an output terminal, said signal input terminals being coupled in common to said first output terminal of said amplifier means;

second gating means comprising first and second current conducting devices each having a gating terminal, a signal input terminal and an output terminal, said signal input terminals being coupled in common to said second output terminal of said amplifier means; and

means for providing periodic gating signals with a period comprising first and second gating intervals respectively coincident with said first and second predetermined intervals of said composite signal, said gating signal means being coupled to said gating inputs of said first and second gating means for rendering said first and second current conducting devices of each of said gating means respectively conductive and non-conductive during said first gating interval to produce antiphase separated burst components at said output terminals of said first devices and for rendering said first and second current conducting devices respectively non-conductive and conductive during said second gating interval to produce antiphase separated chroma components at said output terminals of said second devices, said output terminals of said first devices and said output terminals of said second devices each having associated therewith a differential direct output voltage which remains substantially constant during said first and second gating intervals.

4,038,682

VIDEO DISC PLAYER APPARATUS FOR ESTABLISHING ELECTRICAL CONNECTION BETWEEN A STYLUS ELECTRODE AND A SIGNAL PROCESSING CIRCUIT

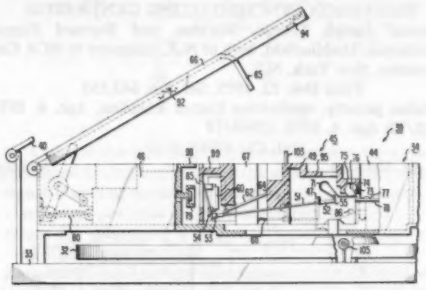
James Austin Allen, Monrovia, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,310

Claims priority, application United Kingdom, Sept. 18, 1975, 38458/75; Nov. 28, 1975, 49108/75

Int. Cl.[2] G11B 25/04

U.S. Cl. 358—128 **6 Claims**



2. In a system for playing back prerecorded signals from a spirally grooved record; said system including a turntable for rotatably supporting said record and a carriage mounted for lateral motion relative to a base plate of said system in correlation with lateral motion of a groove-riding stylus during playback; said carriage having a compartment which has an aperture for permitting said stylus to protrude for engagement with said record during playback; said groove-riding stylus including an electrode; said system further including a support member located within said carriage; said system also including a signal processing circuit having an input terminal located with said carriage; an apparatus comprising:

A. a stylus arm unit including:

a. a stylus arm carrying said stylus at one end thereof;

b. a connector plate; and

c. a compliant member securing said connector plate to the end of said stylus arm remote from said one end;

B. a cartridge body having walls defining a protective enclosure for said stylus arm unit; said cartridge body being dimensioned for reception in said carriage compartment;

C. means for flexibly suspending said connector plate within said cartridge body; said suspending means establishing a location of said connector plate permitting a rigid engagement thereof with said support member when said cartridge body is received in said carriage compartment;

D. a spring for urging said stylus into said record groove during playback; said spring being conductive; said spring having a first end and a second end; said first end of said spring being secured to said stylus so as to effect an electrical connection between said first and said stylus electrode;

E. means for securing said second end of said spring within said cartridge body above said stylus; said securing means establishing a location for said second end of said spring permitting lateral alignment thereof with said input terminal when said cartridge body is received in said carriage compartment;

F. means for providing displacement of said cartridge body toward said input terminal subsequent to cartridge reception in said carraige compartment;

G. means for spatially separating said second end of said spring from said input terminal during said displacement

of said cartridge body in a direction perpendicular to said displacement; and

H. means for causing engagement of said second end of said spring with said input terminal when said second end of said spring is aligned with said input terminal during said displacement of said cartridge body to effect an electrical connection between said second end of said spring and said input terminal.

4,038,683

TELEVISION SYNCHRONIZING GENERATOR

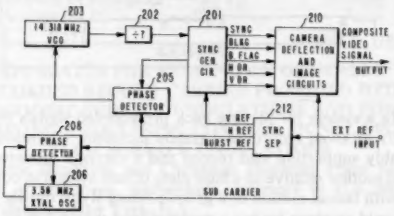
Laurence Joseph Thorpe, Marlton, and Burnard Eugene Nicholson, Haddonfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,731

Claims priority, application United Kingdom, Apr. 4, 1975, 13948/75; Apr. 4, 1975, 13949/75

Int. Cl.² H04N 9/46

U.S. Cl. 358—19 **3 Claims**



1. A synchronizing generator for synchronizing the composite video signal output of a television camera to an external television system reference represented by a source of reference signal having at least line and color reference signal components, wherein said line and color reference signal components are subject to variations in relative time and phase, said generator comprising:

a first phase-lock loop including a sync generating circuit for producing a plurality of synchronizing signals other than color subcarrier, a first source of clock signals coupled to an input of said sync generating circuit, a first phase detector coupled to a line rate output of said sync generating circuit and said external line reference signal component for producing a first control voltage, said first control voltage being coupled to said first clock signal source for synchronizing said plurality of synchronizing signals to the line signal component of said external reference, said synchronized plurality of signals being coupled to utilization means in said camera; and

a second phase-lock loop including a second source of clock signals for producing said color subcarrier, a second phase detector coupled to said second clock source and to said external color reference signal component for producing a second control voltage, said second control voltage being coupled to said second clock source for synchronizing said color subcarrier to the color reference signal component of said external reference, said synchronized color subcarrier being coupled to utilization means in said camera;

said first and second phase-lock loops providing independent synchronism of the line and color signal components of said composite video output signal to said line and color signal components of said source of reference signal.

4,038,684

SIGNAL DETECTION CIRCUIT

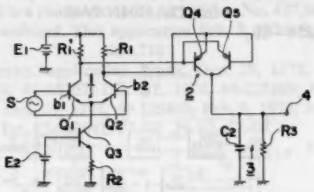
Seiji Miyamoto, Yao, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 18, 1976, Ser. No. 658,921

Claims priority, application United Kingdom, Feb. 18, 1975, 50-20554

Int. Cl.² H04N 9/00

U.S. Cl. 358—27 **9 Claims**



1. A signal detection circuit which comprises a differential amplifier circuit connected to an A.C. signal source and having a pair of first and second output electrodes and a constant current circuit for amplification of the signal from said A.C. signal source, a detector circuit coupled to said differential amplifier circuit said detector circuit including a first transistor and a second transistor for detecting the amplified A.C. signal from said differential amplifier circuit, and a time constant circuit coupled to said detector circuit for producing a rectified D.C. output therefrom, said first output electrode of said differential amplifier circuit being connected to the base of said first transistor and the emitter of said second transistor, with said second output electrode of the differential amplifier circuit being connected to the emitter of said first transistor and the base of said second transistor, and wherein the collectors of said first and second transistors are connected to each other and coupled to said time constant circuit.

4,038,685

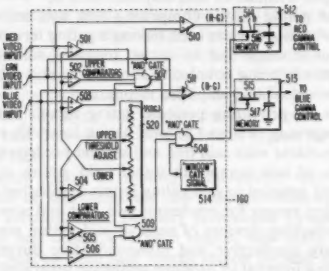
APPARATUS FOR AUTOMATIC GAMMA CONTROL OF TELEVISION COLOR SIGNALS

Lucas John Bazin, Stratford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,684

Int. Cl.² H04N 9/53

U.S. Cl. 358—32 **9 Claims**



1. Automatic gamma correction apparatus for continuously correcting the gamma characteristic of one or more video signals generated by a television camera during the telecasting of an actual program source, said video signals being representative of said program source and occurring within predetermined maximum and minimum amplitude levels during transmission of said signals, comprising:

means providing a pair of signal translating channels for a pair of related video signals;

gamma correction circuitry included in one of said pair of signal translating channels, said gamma correction circuitry responsive to a control signal to alter the gamma correction characteristic of said channel;

means for continuously comparing the amplitude levels of said pair of signals in a relatively narrow range of amplitude levels between the maximum and minimum levels of said signals;

means coupled to said comparing means and to said signal translating channels for developing a control signal of a value related to the differential amplitude between said pair of signals when both of said signals have an amplitude within said narrow range of amplitude levels; and

means for applying said control signal to said gamma correction circuitry for altering the gamma characteristic of said one signal translating channel in a direction so as to make the amplitude of said pair of signals equal.

4,038,686

DEFECT DETECTION AND COMPENSATION

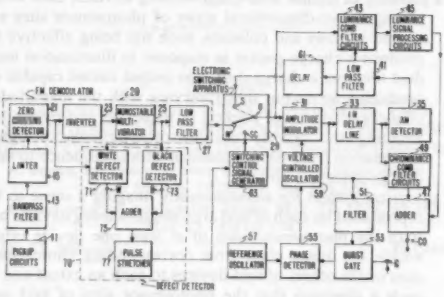
Alfred Lynn Baker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,674

Claims priority, application United Kingdom, Mar. 10, 1975, 9951/75; Feb. 26, 1976, 9951/75

Int. Cl.² H04N *5/76*

U.S. Cl. 358—127 **10 Claims**



1. In a video disc player including pickup circuits for developing during playback of a video disc record an FM signal having an instantaneous frequency subject to variation over a given deviation range in accordance with the amplitude of recorded video signals, the combination comprising:

a zero-crossing detector for developing output pulses indicative of the zero crossings of the signal developed by said pickup circuits;

a monostable multivibrator responsive to the output pulses of said zero-crossing detector;

a low pass filter coupled to receive an output of said multivibrator;

means for utilizing the output of said low pass filter to control the display of images;

means for developing a delayed version of an output pulse of said multivibrator; and

means responsive to coincidence between a portion of an output pulse of said zero-crossing detector and a portion of said delayed version of an output pulse of said multivibrator for altering the mode of operation of said output utilizing means.

4,038,687

VIDEO BLANKING CIRCUIT

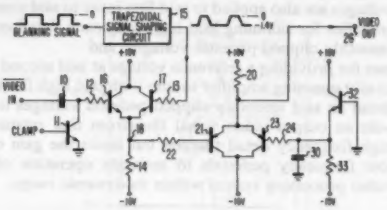
Dennis Michael Schneider, Sewell, and Lucas John Bazin, Vincentown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,301

Claims priority, application United Kingdom, Mar. 19, 1976, 11120/76

Int. Cl.² H04N *5/14*

U.S. Cl. 358—165 **6 Claims**



1. A circuit for inserting a system reference signal into a video signal having active and retrace periods, comprising:

signal clamping means for clamping said video signal to a reference potential during said retrace period;

means for generating a reference signal occurring during said retrace period; and

a non-additive signal mixer responsive to said clamped video signal and said reference signal for developing an output signal wherein said reference signal is inserted into said video signal retrace period.

4,038,688

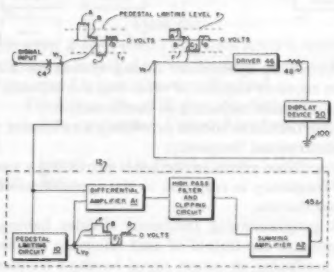
AUTOMATIC LOW FREQUENCY GAIN LIMITING BY ADDITION METHOD IN VIDEO PROCESSING SYSTEM

Sen-Te Chow, Alexandria, and Earl M. Thomas, Arlington, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1976, Ser. No. 650,483

Int. Cl.² H04N *5/14*

U.S. Cl. 358—174 **8 Claims**



1. An automatic low frequency pedestal gain limiting circuit for composite video signals in an AC coupled video processing system, said gain limiting circuit comprising:

a pedestal limiting circuit for clipping the low frequency pedestal voltages of said composite video signals into smoothly clipped pedestal voltages when said low frequency pedestal voltages exceed a pedestal limiting voltage level;

a differential amplifier having first and second inputs and an output in which said composite video signals are applied at said first input to said differential amplifier and said smoothly clipped pedestal voltages are applied at said

second input to said differential amplifier wherein said video signals and said smoothly clipped pedestal voltages are differentially compared by said differential amplifier to provide short pedestal voltages having the high frequency detail of said composite video signals remaining thereon at said output of said differential amplifier;

a summing amplifier having first and second inputs and an output;

means for removing said short pedestal voltages and passing said high frequency detail to said first input of said summing amplifier wherein said smoothly clipped pedestal voltages are also applied to said first input to said summing amplifier for summing said high frequency detail on said smoothly clipped pedestal voltages; and

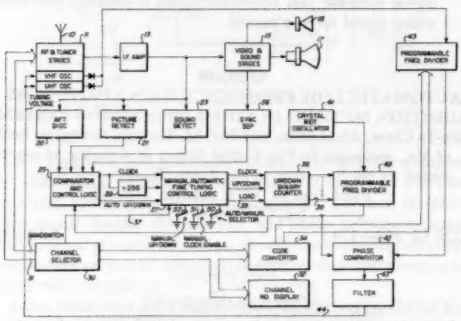
means for providing a reference voltage at said second input to said summing amplifier to sum with said high frequency detail on said smoothly clipped pedestal voltages to provide an output video signal therefrom that retains said high frequency detail thereon but limits the gain of the low frequency pedestals to maintain operation of said video processing system within its dynamic range.

4,038,689

FREQUENCY SYNTHESIZER TUNING SYSTEM WITH MANUAL FINE TUNING CONTROL

Theodore S. Rzeszewski, Lombard; Paul D. Frantzis, Chicago, both of Ill., and Sotirios Sideris, Sunnyvale, Calif., assignors to Matsushita Electric Corporation of America, Franklin Park, Ill.

Filed June 14, 1976, Ser. No. 695,855
Int. Cl.² H04N *5/44*
U.S. Cl. 358—191 **12 Claims**



1. A frequency synthesizer tuning system for a tuner of a television receiver capable of receiving a composite television signal, said system including in combination:

reference oscillator means providing a reference signal at a predetermined frequency;

local oscillator means in the tuner providing a variable output frequency in response to the application of a control signal thereto;

a first programmable frequency divider having an input coupled to the output of said reference oscillator means for producing an output signal having a frequency which is a programmable fraction of the frequency of the signal applied to the input thereto from said reference oscillator means;

a second programmable frequency divider having an input coupled to the output of said local oscillator means and producing an output signal having a frequency which is a programmable fraction of the frequency of the signal applied to the input thereto from said local oscillator means;

channel selection means coupled to said second programmable frequency divider for controlling said second programmable frequency divider to establish the programmable fraction thereof;

means coupled to the outputs of said first and second frequency dividers for developing a control signal and applying such control signal to said local oscillator means for controlling the frequency of operation thereof; and

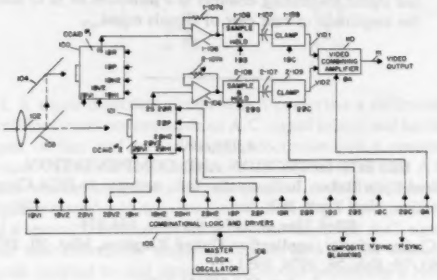
manual fine tuning control means coupled to said first programmable frequency divider for controlling said first frequency divider to establish the programmable fraction of division thereof as desired by an operator of said manual fine tuning control means.

4,038,690

CHARGE-COUPLED DEVICE VIDEO-SIGNAL-GENERATING SYSTEM

Kenneth A. Hoagland, Smithtown, N.Y., assignor to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Filed Jan. 21, 1976, Ser. No. 651,117
Int. Cl.² H04N *3/14*
U.S. Cl. 358—213 **10 Claims**



1. A video-signal-generating system comprising:

a plurality of similar area-image-sensing devices, each comprising a two-dimensional array of photosensor sites arranged in rows and columns, each site being effective to produce a charge packet in response to illumination incident thereon, a charge-detection output circuit capable of producing an output signal varying with the magnitudes of successive charge packets in sequence, and means for effecting the orderly transfer of charge-packet-signal information from the photosensor sites in sequence to said charge-detection circuit;

an optical system for simultaneously imaging a scene to be reproduced on each of said area-image-sensing devices but with the photosensor sites of at least one device offset within the image plane from corresponding photosensor sites of the others of said devices to such an extent and in such a direction that the photosensor sites of said one device sense or provide access to image point information which cannot be sensed or accessed by the others of said devices during the same field readout interval;

control circuitry for periodically and sequentially causing the transfer of the charge-packet-signal information developed at each of the photosensor sites to the charge-detection output circuit of its respective device;

and means for combining the output signals of said output circuits to provide a video signal for reproduction.

4,038,691

STILL IMAGE SLIDE COMBINATION WITH SEQUENTIALLY ACTIVATED AUDIO CHANNELS PER SLIDE

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Mar. 26, 1976, Ser. No. 671,013
Int. Cl.² G11B *5/008, 23/44*
U.S. Cl. 360—2 **16 Claims**

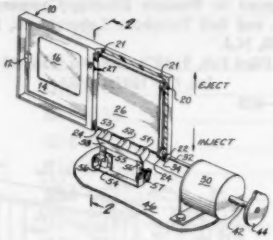
1. Means for providing stationary images and sound related to said images, comprising the combination:

a plurality of non-translatable magnetic transducer heads;

an endless magnetic medium in cooperation with said heads;

control means connected to said heads for providing a plurality of sound tracks for each of the images, one said head per sound track, said control means including

means for disconnecting a first of said heads at end of its corresponding sound track and connecting a second of said heads at the beginning of its corresponding sound track, substantially only one of said heads being activated during any one transducing time period;



means for transducing an analog intelligence message between said heads and sound tracks, said means for disconnecting and connecting enabling the message to be continued from one of said sound tracks to another; and

means, coupled to the control means, for initiating translation of the magnetic medium and for translating said magnetic medium a whole number of complete revolutions, one said transducer head activated for each of said revolutions, and for terminating translation of said magnetic medium at the end of a last of said complete revolutions.

4,038,692

TAPE SENSING DEVICE FOR MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

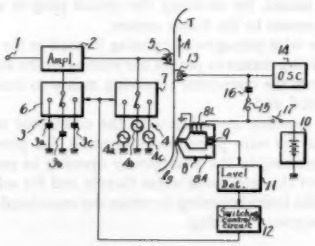
Kenkichi Umeda, Tokyo, and Hiroyuki Yamauchi, Urawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 6, 1975, Ser. No. 556,120

Claims priority, application Japan, Mar. 12, 1974, 49-28813

Int. Cl.² G11B *5/45*

U.S. Cl. 360—25 **16 Claims**



1. A device for sensing the type of magnetic coating on a magnetic tape, comprising a DC magnetic recording head adapted to engage the magnetic tape, means for applying a predetermined DC voltage to said head so that the latter applies a DC magnetic flux to the tape while said tape is at rest, means for discontinuing the application of said DC magnetic flux, means for sensing the remanance of the magnetic tape while the latter remains at rest following the discontinuance of said DC magnetic flux to the tape, the level detecting means for detecting the level of the sensed remanence of the tape as an indication of the type of magnetic coating thereon.

4,038,693

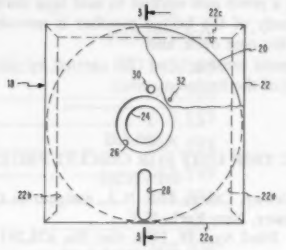
ANTI-STATIC MAGNETIC RECORD DISK ASSEMBLY

Coy Lee Huffine, Rochester; Larry Frederick Mattson, Pine Island; Karl Allen Shidler, Rochester, and Norman Edward Slindee, Austin, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,943

Int. Cl.² G11B *5/016, 23/02;* H05F *3/00*

U.S. Cl. 360—99 **4 Claims**



1. A magnetic record assembly including:

a magnetic disk of highly electrically insulating, flat, uniform thickness sheet material,

a jacket of highly electrically insulating material enclosing said disk and having a central opening through it by means of which the disk may be rotatably driven within the jacket and having a slot therein for receiving a magnetic transducer to have a data transferring relationship with the disk and having flat internal faces adjacent to and extending along the faces of said disk,

a layer of a porous low friction dusting fabric within said jacket and in wiping contact with the faces of said disk as the disk rotates within the jacket, and

a uniform thickness flat thin layer of electrically conducting non-porous material within said jacket and in contact with and between said flat internal jacket faces and said layer of dusting fabric for draining static electricity from the jacket.

4,038,694

PLAYER FOR TAPE CARTRIDGES AND CASSETTES

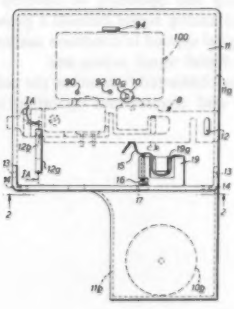
Edward Alexander Leshik, London, England, assignor to Hellermann Cassettes Limited, Crawley, England

Filed Sept. 30, 1975, Ser. No. 618,225

Claims priority, application United Kingdom, Oct. 1, 1974, 42549/74

Int. Cl.² G11B *21/22, 21/24, 5/56*

U.S. Cl. 360—105 **14 Claims**



1. Tape transport apparatus, comprising:

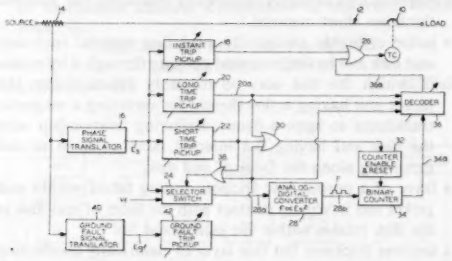
a. a tape deck (11) including means for receiving a tape module containing a length of tape;
b. a unitary elongate bridge member (B) formed of synthetic plastic material, said bridge member comprising a main body portion, and a first extension portion hingedly connected with one end of said main body portion by a first resilient hinge portion (21), said bridge member being disposed on the tape deck with said extension rigidly connected with the tape deck, said first resilient hinge having a pivot axis normal to said tape deck so that the main body of the bridge member is movable in an arc across the tape deck; and
c. a magnetic sensing head (28) carried by said main body portion of the bridge member.

4,038,695

STATIC TRIP UNIT FOR CIRCUIT PROTECTIVE DEVICES

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, New York, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,251
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—96 **23 Claims**



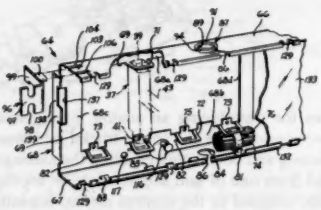
1. A static trip unit for application in an electric circuit breaker to initiate its interruption of a protected electrical distribution circuit automatically in response to an abnormal circuit condition, said trip unit comprising, in combination:
A. a signal translator coupled to the distribution circuit for developing an analog signal proportional to the magnitude of current flowing in the circuit;
B. an analog to digital converter electrically connected to said signal translator for generating a digital signal having a pulse frequency proportional to the square of said analog signal;
C. a binary counter connected to said converter and operable to accumulate a count of said digital signal pulses;
D. a threshold detector having an input connected to receive said analog and operating to develop an output signal when said analog signal exceeds a preselected level, said output signal applied to condition said counter to accumulate said digital signal pulses; and
E. a decoder connected to monitor the pulse count accumulating in said counter and operating to generate a trip initiating signal when said pulse count reaches a preselected total.

4,038,696

STRUCTURE FOR PROVIDING SUPPORT FOR CIRCUIT PLUG-IN UNITS, CONNECTORS AND RELATED WIRING

John Orrell Etchison, Jr., Clemmons; Garland Ralph Jobe, and Robert Henry Wellons Jones, Jr., both of Greensboro, all of N.C., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1976, Ser. No. 656,213
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—415 **18 Claims**



1. A structure for providing support for a plurality of circuit plug-in units, a corresponding plurality of connectors and associated wires, which comprises:
means for supporting in a prescribed array a plurality of the circuit plug-in units of a prescribed depth dimension and a prescribed thickness dimension;
means, independent of the circuit plug-in unit supporting means, for receiving a plurality of the connectors in a prescribed array corresponding to the prescribed array of the supporting of the circuit plug-in units;
bendable means, formed integrally with the connector receiving means, for enclosing portions of each of the plurality of connectors to secure the connectors with the connector receiving means in the prescribed array;
means for fastening the circuit plug-in unit supporting means with the connector receiving means;
frame means for supporting the circuit plug-in unit supporting means with the connector receiving means in the prescribed array;
means, formed integrally with the circuit plug-in unit supporting means, for securing the circuit plug-in unit supporting means to the frame means;
at least one wire passageway opening formed in the connector receiving means to permit the routing of the associated wires from the connector receiving means to areas external thereof; and
means, in movable assembly with the connector receiving means at the wire passageway opening, for providing a lateral opening to the passageway opening to permit the placing of the associated wires therein and for selectively closing the lateral opening to retain the associated wires in the passageway opening.

DESIGN PATENTS

GRANTED JULY 26, 1977

ERRATA

For CLASS	See PATENT NO.
013–024	245,185
013–040	244,186
048–033	245,187
014–073	245,198
014–070	245,199
024–067	245,202
024–021	245,203
002–378.1	245,204

DESIGNS

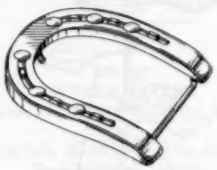
JULY 26, 1977

245,126
SHOE
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima Tokushima, Japan
Filed Aug. 4, 1975, Ser. No. 601,840
Claims priority, application Japan, May 28, 1975, 50-21540
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—308

245,127
SHOE
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Filed Aug. 4, 1975, Ser. No. 601,842
Claims priority, application Japan, May 28, 1975, 50-21537
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—308

245,128
SHOE
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Filed Aug. 4, 1975, Ser. No. 601,841
Claims priority, application Japan, May 28, 1975, 50-21539
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—308

245,129
BELT BUCKLE
Ronal L. Adams, and Forest E. Brown, both of Phoenix, Ariz., assignors to Drummond, Nelson & Ptak
Filed Aug. 11, 1975, Ser. No. 603,325
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—431

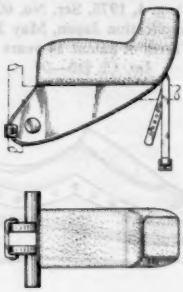


245,130
BUCKLE FOR LUGGAGE STRAP OR THE LIKE
Alain D. Perrin, Boulogne, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 2, 1975, Ser. No. 573,943
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—444

245,131
DISPLAY STAND
Berndt Johnsson, Linkoping, Sweden, assignor to Moderna Butiksinredningar AB, Sweden
Filed Feb. 4, 1976, Ser. No. 655,115
Term of patent 3½ years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—24

245,132
CHAIR
Floyd C. Gale, Jr., 32658 Nantasket Drive, Rancho Palos Verdes, Calif. 90274
Continuation-in-part of Ser. No. 404,351, Oct. 9, 1973, which is a continuation-in-part of Ser. No. 346,002, March 29, 1973. This application June 24, 1975, Ser. No. 589,670
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

245,133
AUXILIARY BICYCLE SEAT
Bruce W. Kerley, 6311 Yucco St., No. 1084, Hollywood, Calif. 90028
Filed June 11, 1976, Ser. No. 692,573
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1

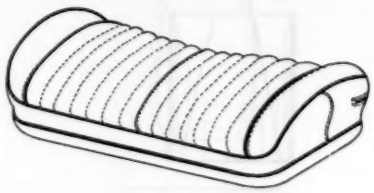


245,134
COMBINED GARMENT DISPLAY ARM AND MOUNTING BRACKET
Stanley A. Friedberg, 8001 Paso Robles, Van Nuys, Calif. 91406
Filed Sept. 5, 1975, Ser. No. 610,533
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—116

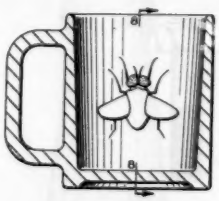
245,135
TABLE
Richard B. Saltz, 16941 Edgewater Lane, Huntington Harbor, Calif. 92649
Filed Jan. 21, 1976, Ser. No. 651,054
Term of patent 14 years
Int. Cl. D6—*03, 04*
U.S. Cl. D6—177

245,136
STAND FOR POTTED PLANTS
Thomas J. Hughes, Jr., 2050 Valencia Drive, Northbrook, Ill., 60062
Filed Dec. 19, 1975, Ser. No. 642,661
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—183

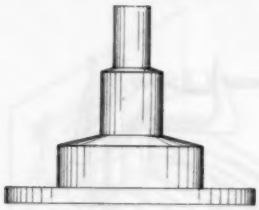
245,137
CUSHION
Meyer Benn, 2903 NW. 60th Ave., Sunrise, Fla. 33313
Filed Oct. 20, 1975, Ser. No. 623,893
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



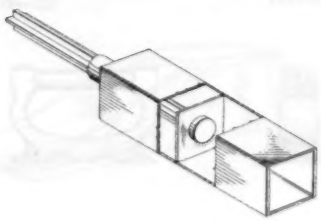
245,138
NOVELTY CUP
Makoto M. Iwashita, 1222 Glenmorie Drive, Lake Oswego, Oreg. 97034
Filed July 23, 1975, Ser. No. 598,677
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—8



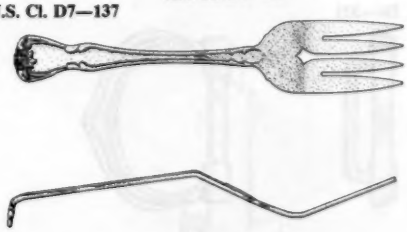
245,139
CAKE PAN STAND
Jack D. Graham, 75 McMeekin St., Sault Ste. Marie, Ontario, Canada
Filed July 17, 1975, Ser. No. 596,902
Claims priority, application Canada, Jan. 30, 1975, 300175
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—83



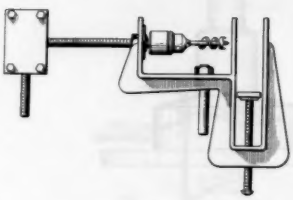
245,140
BUTTER BASTER
William E. Benson, 17351 Lakeview Drive, Morgan Hill, Calif. 95037
Filed July 14, 1975, Ser. No. 595,695
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—99



245,141
FORK OR OTHER SIMILAR ARTICLE OF FLATWARE
Thomas S. Eldridge, 2521 Hilltop Road, Schenectady, N.Y. 12309, and Robert A. Sovik, 13 Meadow Valley, Elnora, N.Y. 12065
Filed Oct. 18, 1974, Ser. No. 516,101
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

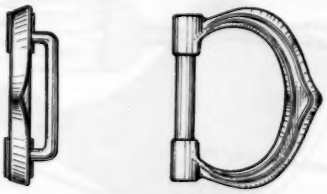


245,142
RIGHT ANGLE DRILLING APPARATUS FOR DRILLING WIRING HOLES AND THE LIKE THROUGH BUILDING STUDS, JOISTS, RAFTERS AND THE LIKE
Karman H. Simms, Rte. 39, Box 100, Canvas, W. Va. 26662, and Nathan O. Sanders, Box 65, Summersville, W. Va. 26651
Filed May 13, 1976, Ser. No. 686,991
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



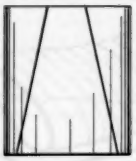
245,143
FIXING RING FOR LUGGAGE HANDLE OR THE LIKE
Alain D. Perrin, Boulogne, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 2, 1975, Ser. No. 573,942
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—321

245,144
FIXING RING FOR LUGGAGE HANDLE OR THE LIKE
Alain D. Perrin, Boulogne, France, assignor to Les Must De Cartier-France, Paris, France
Filed May 2, 1975, Ser. No. 573,944
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D8—321



245,145
SPACER FOR REINFORCED CONCRETE
Ferdinand William Berry, "Latchetts" 108 Woodland Drive, Hove, 4, Sussex, England
Filed Sept. 16, 1975, Ser. No. 613,915
Claims priority, application United Kingdom, Mar. 19, 1975, 970365/75
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

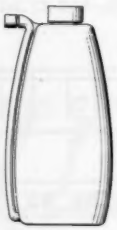
245,146
CYLINDRICAL ANCHOR FOR SECURING OBJECTS SUCH AS MOBILE HOMES AND THE LIKE TO THE EARTH
Earnest R. Mullenax, P.O. Box 32349 Warr Acres Branch, Oklahoma City, Okla. 73132
Filed Jan. 14, 1974, Ser. No. 432,882
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349



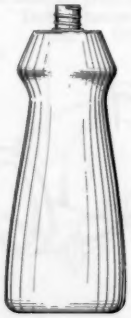
245,147
HEXAGONAL HEADED BOLT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Filed Oct. 7, 1975, Ser. No. 620,339
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387

245,148
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 23, 1976, Ser. No. 669,787
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

245,149
BOTTLE
Philip F. Hartung, 655 Main St., East Greenwich, R.I. 02818
Filed Dec. 10, 1975, Ser. No. 639,492
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

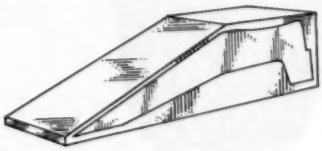


245,150
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—89



245,151
PACKAGE OF MINIATURE BOTTLES
William C. Sturm, 3017 NE. Third Ave., Fort Lauderdale, Fla. 33334
Filed Jan. 19, 1976, Ser. No. 650,121
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

245,152
CONTAINER FOR AUTO REPAIR RAMP OR THE LIKE
Jack V. Miller, Sierra Madre, Calif., assignor to Acroform Corporation
Filed July 28, 1975, Ser. No. 599,463
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—229

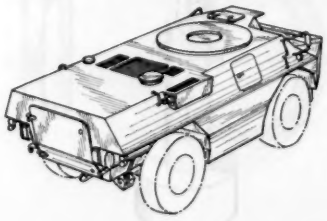


245,153
BUOY
Albert W. Flor, 13534 Bali Way, Marina Del Rey, Calif. 93913
Filed June 23, 1975, Ser. No. 589,142
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—107

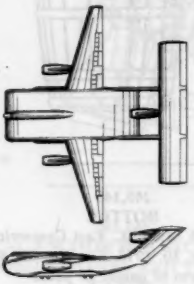
245,154
FINGER RING
John R. Unertl, 1573 Duncan Drive, Pittsburgh, Pa. 15237
Filed Aug. 28, 1975, Ser. No. 608,665
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D11—37

245,155
FLOWER POT
Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association, Southfield, Mich.
Filed May 17, 1976, Ser. No. 687,188
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—153

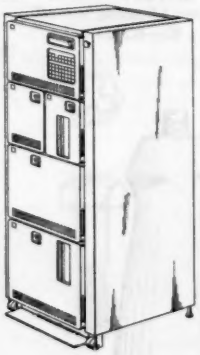
245,156
ARMOURED VEHICLE BODY
Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Eqipements Mecaniques Saviem, Suresnes, France
Filed Oct. 8, 1975, Ser. No. 620,779
Claims priority, application France, Apr. 10, 1975, 73.780
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



245,157
AIRPLANE
Gerhard Ernst Seidel, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 591,973, June 30, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,317
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—76

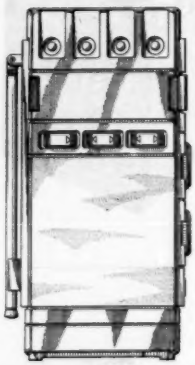


245,158
DATA PROCESSING SYSTEM CONSOLE
Myron Fulenwider Davis, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 19, 1976, Ser. No. 678,013
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



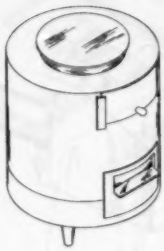
245,159
TEXT PROCESSING CONSOLE
Tommy Ray Hardy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 3, 1976, Ser. No. 692,409
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42

245,160
PORTABLE RADIO
John T. Houlian, Fayetteville, N.Y., assignor to General Electric Company
Filed Dec. 22, 1975, Ser. No. 642,950
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

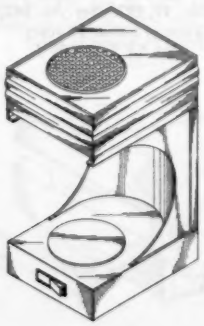


245,161
BEER MUG CHILLER
Timothy Perkins, 17 Greene Ave., Brooklyn, N.Y. 11238
Filed June 20, 1975, Ser. No. 588,676
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D15—79

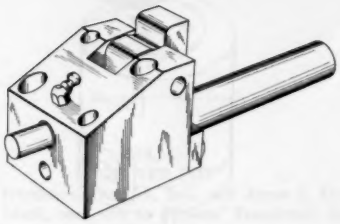
245,162
FOOD OVEN OR SIMILAR ARTICLE
Elvis Simon Zimmer, Andover, Minn., assignor to Jeno F. Paulucci, Duluth, Minn.
Filed Apr. 2, 1976, Ser. No. 673,041
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—108



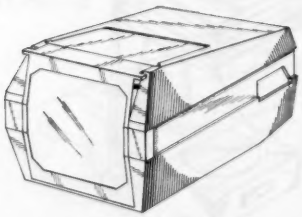
245,163
COFFEE-MAKER
Richard H. George, 7903 Aleta, Spring, Tex. 77373
Filed June 5, 1975, Ser. No. 584,016
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D15—113



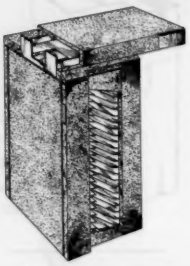
245,164
CAM PUNCH UNIT
James E. Persik, and Gerald E. Persik, both of Menomonee Falls, Wis., assignors to J. J. & M.
Filed May 10, 1976, Ser. No. 684,883
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—128

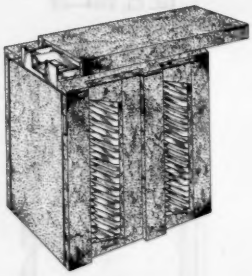


245,165
HEAD FOR AN OVERHEAD PROJECTOR
Gerald E. Drake, Lucas Township, Dunn County, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Dec. 19, 1975, Ser. No. 642,479
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—26

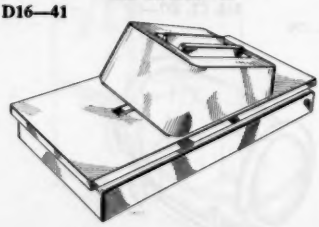


245,166
COLLATOR FOR AN ELECTROPHOTOGRAPHIC APPARATUS
Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 3, 1975, Ser. No. 637,487
Term of patent 14 years
Int. Cl. D16—*3*
U.S. Cl. D16—32

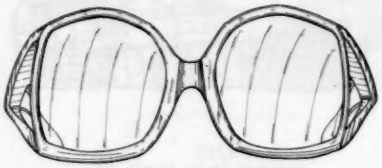


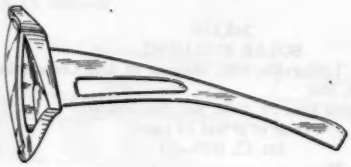


245,167
SPLICER FOR MAGNETIC TAPE
Mario F. Fernandez, and Mervin B. Kronfeld, both of Minneapolis, Minn., assignors to Nortronics Company, Inc., Minneapolis, Minn.
Filed Feb. 17, 1976, Ser. No. 658,539
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—41

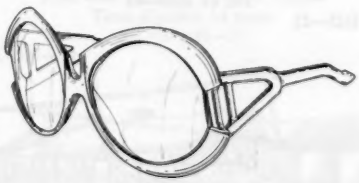


245,168
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed Oct. 14, 1975, Ser. No. 621,820
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

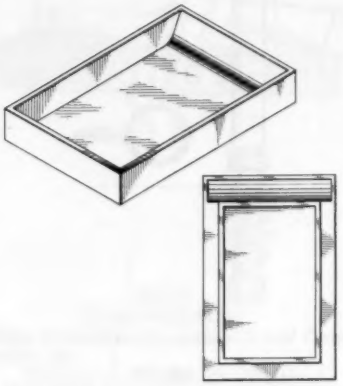




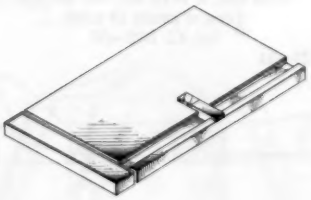
245,169
EYEGLASS FRAME
Elfriede Teufelhart, Vienna, Austria, assignor to Optyl Corporation, Norwood, N.J.
Filed Oct. 21, 1975, Ser. No. 624,331
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



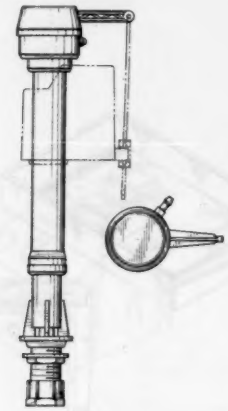
245,170
NOTE PAPER TRAY
Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed May 19, 1975, Ser. No. 578,492
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



245,171
LIST FINDER
Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Division of Ser. No. 541,425, Jan. 16, 1975, Pat. No. Des. 243,604.
This application July 26, 1976, Ser. No. 708,417
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



245,172
VERTICALLY ADJUSTABLE BALL COCK
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631
Filed July 19, 1976, Ser. No. 706,524
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

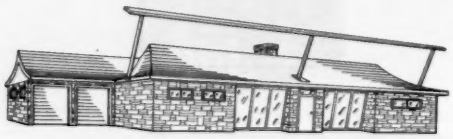


245,173
SOLAR HEAT EXCHANGE ELEMENT
Egon Van Leeuwen, 35 Richmond St., Blackburn, Victoria, Australia (3130)
Filed Oct. 30, 1975, Ser. No. 627,453
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

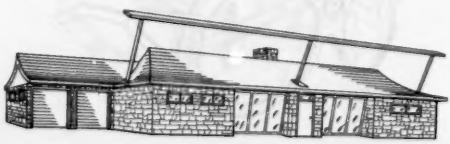
245,174
DISCOTHEQUE BUILDING
James A. Cosentino, Cheektowaga, N.Y., assignor to The Executive, A Motor Hotel of Buffalo, Inc., Buffalo, N.Y.
Filed Dec. 5, 1975, Ser. No. 637,873
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11

245,175
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,706
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

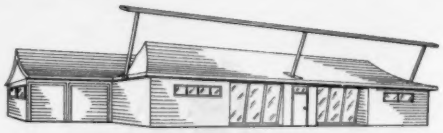
245,176
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,707
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



245,177
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,708
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

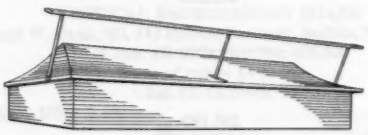


245,178
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,709
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



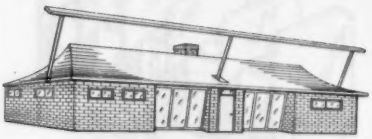
245,179
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,010
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

245,180
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,043
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

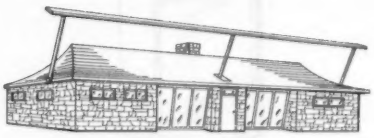


245,181
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,044
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21

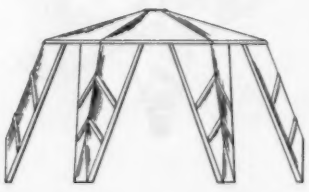
245,182
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Oct. 6, 1976, Ser. No. 729,747
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



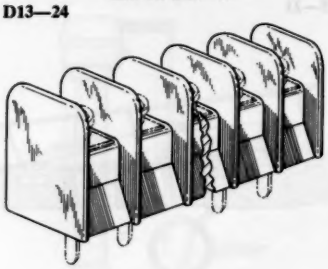
245,183
SOLAR BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Oct. 6, 1976, Ser. No. 729,748
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



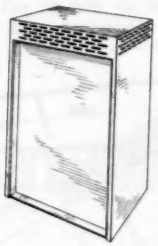
245,184
SHELTER
Donald E. Lowman; Ronald L. Hovick, and Virgil E. Sellers, all of Box 633, Cedar Falls, Iowa 50613
Filed Jan. 19, 1976, Ser. No. 650,054
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56



245,185
TERMINAL BLOCK
Edward A. Obuch, Linden, N.J., assignor to Amerace Corporation, New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 661,380
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



245,186
ELECTRICAL EQUIPMENT CABINET
Alfred M. Hase, 6 Manorwood Road, Scarborough, Ontario, Canada
Filed Oct. 24, 1975, Ser. No. 625,390
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—40

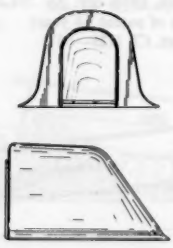


245,187
LAMP OR THE LIKE
Hideo Moriyama, c/o Moriyama Sangyo Kabushiki Kaisha, 5-10, Nakanobu, 2-chome, Shinagawa, Tokyo, Japan
Filed May 20, 1976, Ser. No. 688,244
Claims priority, application Japan, Dec. 3, 1975, 50-47581
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—33

245,188
GAS LIGHTER
Alfred Racek, Seitenberggasse 50, Vienna 16, Austria
Filed Oct. 17, 1975, Ser. No. 623,247
Claims priority, application Austria, Apr. 23, 1975, 503482/75
Term of patent 7 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

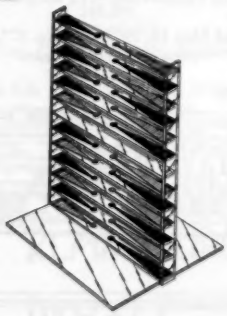
245,189
LIGHTER
Katsuhisa Terasaki, 43, Okimiya, Edogawa, Tokyo, Japan
Filed Oct. 30, 1975, Ser. No. 627,266
Claims priority, application Japan, July 23, 1975, 50-30617
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

245,190
DOGHOUSE
Hiromi Higo, 1320 Princess St., Richmond, Canada (V7E 3S2)
Filed Apr. 7, 1976, Ser. No. 674,640
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

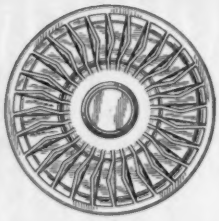


245,191
HOUSING FOR CAT LITTER BOX
Fred M. Gore, 2808 Oak Lawn, Dallas, Tex. 75219
Filed Mar. 31, 1976, Ser. No. 672,508
Term of patent 7 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

245,192
VERTICAL BACKGAMMON BOARD
Joseph W. Davis, III, 119 Bidwell Parkway, Buffalo, N.Y. 14222
Filed Feb. 19, 1976, Ser. No. 659,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

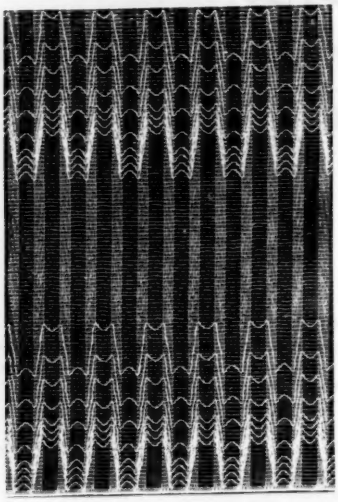


245,193
ROTATABLE CARD HOLDING CARROUSEL
William B. Cooke, Marlboro, and Arthur P. Venditti, Peabody, both of Mass., assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Dec. 29, 1975, Ser. No. 644,481
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A

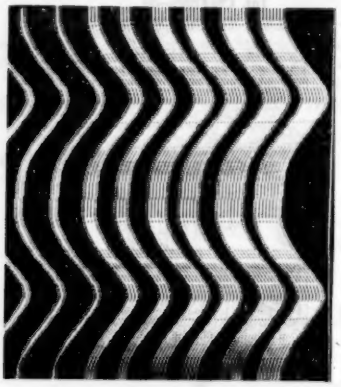


245,194
PLAYHOUSE FOR DISPLAYING MOTION PICTURES
George N. Bell, 938 Nature Drive, Duncanville, Tex. 75116
Filed Oct. 20, 1975, Ser. No. 624,101
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

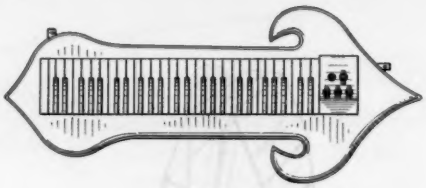
245,195
CURTAIN MATERIAL
Peter E. Schroeder, Gardisette International AG, Pilatusstrasse 38,6003 Lucerne, Switzerland
Filed Aug. 25, 1975, Ser. No. 607,840
Claims priority, application Germany, May 26, 1975, URA 360/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 D



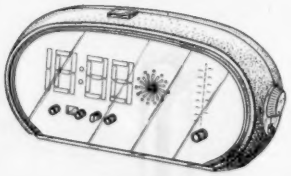
245,196
CURTAIN MATERIAL
Peter E. Schroeder, Gardisette International AG, Pilatusstrasse 38, 6003 Lucerne, Switzerland
Filed Aug. 25, 1975, Ser. No. 607,603
Claims priority, application Germany, May 26, 1975, URA 360/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 R



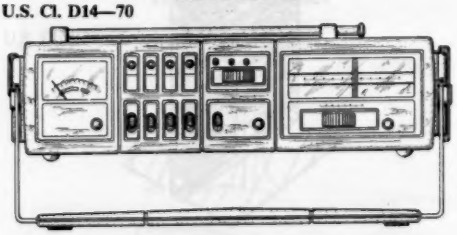
245,197
PORTABLE, ELECTRONIC, REMOTE-CONTROL, WIRELESS KEYBOARD MUSICAL INSTRUMENT
Jerry Lewis Noury, Jr., 522 W. 29th St., New York, N.Y. 10001
Filed July 30, 1975, Ser. No. 600,471
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—1 R



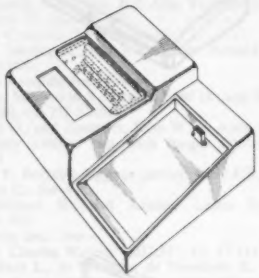
245,198
CLOCK RADIO
Koji Terada, Kawasaki, and Kunio Kitagawa, Tokyo, both of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Dec. 5, 1974, Ser. No. 529,606
Claims priority, application Japan, June 8, 1974, 49-19212
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



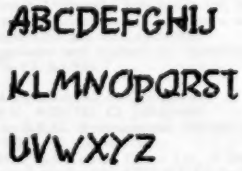
245,199
PORTABLE RADIO
John T. Houlihan, Fayetteville, N.Y., assignor to General Electric Company
Filed May 13, 1975, Ser. No. 577,108
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



245,200
PRINTER CONSOLE HOUSING FOR A HAND-HELD CALCULATOR
Newton R. Packard, 3994 Toland Circle, Los Alamitos, Calif. 90720
Filed Jan. 20, 1975, Ser. No. 542,264
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



245,201
TYPE FONT
William R. Bitticker, Centerville, Ohio, assignor to The Mead Corporation
Filed Feb. 13, 1976, Ser. No. 657,851
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



245,202
EAR PROTECTION PLUG SET
Lambert Carl Curt Asker, Talltitevagen 17, 230 50 Bjarred, Sweden
Filed Sept. 3, 1975, Ser. No. 610,032
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—67

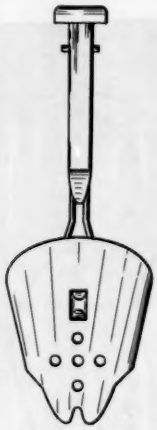
245,203
SPHYGMOMANOMETER
John Cuccio, Westport, Conn., assignor to Sybron Corporation, Rochester, N.Y.
Filed Aug. 27, 1975, Ser. No. 608,144
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

245,204

COMBINED SHOE TREE AND SHOE HORN

Philip J. Walter, 4109 Victoria St., Minnetonka, Minn. 55343

Filed Apr. 28, 1975, Ser. No. 572,520
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D2—378.1

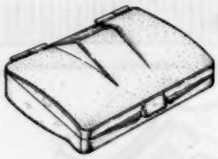


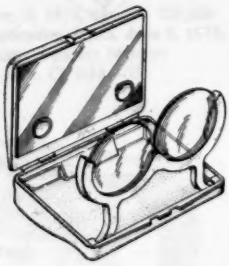
245,205

EYE MAKE-UP KIT

E. Vincent Santurbane, Centerville, Ohio, assignor to Fashion Optics, Inc.

Filed Nov. 10, 1975, Ser. No. 630,525
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—76





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C. Nielsen Company: *See—*
McAnulty, James C.; and McCarthy, Edwin B., 4,038,504, Cl. 200-11.0DA.

A. E. Staley Manufacturing Company: *See—*
Eastman, James E., 4,038,482, Cl. 536-110.000.

AB Nike Hydraulik: *See—*
Barcella, Giovanni, 4,037,822, Cl. 254-124.000.

AB Tellusond: *See—*
Hill, Jan, 4,037,966, Cl. 356-102.000.

Abe, Yuji: *See—*
Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, 4,038,214, Cl. 252-458.000.

Abitibi Paper Company Ltd.: *See—*
Baldwin, Stanley H.; and Willoughby, Arnold E., 4,038,131, Cl. 162-103.000.

Acme Visible Records, Inc.: *See—*
Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.

Acton, Daniel D.; and Boerstler, John W., to Anchor Hocking Corporation. Safety closure cap with torque control. 4,037,747, Cl. 215-219.000.

Adams, John F. Portable luggage carrier. 4,037,858, Cl. 280-652.000.

Adams, Lester E.: *See—*
Burris, Robert E.; and Adams, Lester E., 4,038,532, Cl. 235-151.300.

ADCO Buckets, Inc.: *See—*
Hemphill, Charles Wayne, 4,037,337, Cl. 37-141.00R.

Adelman, Robert L., to Du Pont de Nemours, E. I., and Company. Electroplating of polypropylene compositions. 4,038,042, Cl. 428-625.000.

Adomanite, Yanina Antono: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Advanced Instrumentation Inc.: *See—*
Gates, Wendall C., 4,037,472, Cl. 73-421.00B.

Aetna-Standard Engineering Company: *See—*
Remner, Robert A.; and Rowland, Leroy V., 4,037,453, Cl. 72-252.000.
Schuetz, James W., 4,037,449, Cl. 72-209.000.
Schuetz, James W., 4,037,451, Cl. 72-238.000.

Agency of Industrial Science & Technology: *See—*
Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.
Yamaga, Joji; and Jido, Morio, 4,038,511, Cl. 219-121.00P.

AGFA-Gevaert Aktiengesellschaft: *See—*
Escales, Eberhard, 4,037,768, Cl. 226-43.000.
Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, 4,038,079, Cl. 96-60.0BF.
Schroder, Rolf; and Nicko, Reinhard, 4,038,671, Cl. 354-197.000.
Schroder, Rolf, 4,038,673, Cl. 354-222.000.

AGFA-GEVAERT N.V.: *See—*
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,038,075, Cl. 96-22.000.
Willems, Jozef Frans; and Vandenberghe, Antoon Leon, 4,038,083, Cl. 96-94.00R.

Aglitsky, Vladimir Efimovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Agosta, Frank L. Appliance and method for facilitating hairpiece attachment. 4,037,274, Cl. 3-1.000.

Agway, Inc.: *See—*
Talbert, Norwood K., 4,038,180, Cl. 210-10.000.
Talbert, Norwood K., 4,038,181, Cl. 210-10.000.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Resilient driving connection. 4,037,432, Cl. 64-27.00L.

Ahlschwede, Brian Alvin; and Whisler, Edwin Lee, to Deere & Company. Service brake lock mechanism. 4,037,487, Cl. 74-529.000.

Aikoh Co., Ltd.: *See—*
Takashima, Masaru, 4,038,069, Cl. 75-96.000.

Airco, Inc.: *See—*
Shrader, Alan C., 4,038,484, Cl. 13-31.000.

Airwick Industries, Inc.: *See—*
Hennart, Claude; and Blanc, Rene, 4,037,352, Cl. 43-129.000.
Hennart, Claude; Dulat, Marcel; and Blanc, Rene, 4,037,353, Cl. 43-129.000.

Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., to Eco-Control, Inc. Halogen complexing alcohols and nitriles. 4,038,459, Cl. 429-15.000.

Ajami, Alfred M.: *See—*
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,038,460, Cl. 429-15.000.

Akebono Brake Industry Company, Ltd.: *See—*
Maehara, Toshifumi, 4,037,689, Cl. 188-1.00A.

Aktiebolaget Electrolux: *See—*
Svanteson, Sven Elis Ake, 4,038,184, Cl. 210-59.000.

Aktiebolaget Svenska Flaktfabriken: *See—*
Strindehag, Ove; and Wrangel, Erik, 4,038,059, Cl. 55-388.000.

Aktieselskabet Grindstedvaerket: *See—*
Eliasson, Rune; and Nedenskov, Poul, 4,038,305, Cl. 260-468.00K.

Akzona Incorporated: *See—*
Jacoby, Charles H., 4,038,443, Cl. 427-136.000.

Alan White Company, The: *See—*
White, Douglas M.; and White, Alga L., 4,037,296, Cl. 24-90.00B.

Albers, Teunis. Cattle locking apparatus. 4,037,566, Cl. 119-147.000.

Albert, Jack, to American Lottery Equipment, Inc. Coin operated dispensing machine. 4,037,702, Cl. 194-93.000.

Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., to American Hospital Supply Corporation. Profile analysis pack and method. 4,038,030, Cl. 23-230.00B.

Albright & Wilson Limited: *See—*
Crowther, John Cooper; and Renton, Stanley, 4,038,160, Cl. 204-51.000.

Alburger, James R. Method of regenerating a glycol-ether type inspection penetrant remover by solvent extraction. 4,037,466, Cl. 73-104.000.

Alcan Research and Development Limited: *See—*
Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, 4,038,039, Cl. 23-293.00R.

Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Calculator-print cradle system. 4,038,535, Cl. 235-152.000.

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich. Assembling and repair station of a plant for pneumatic transportation of goods in containers through a pipeline. 4,037,805, Cl. 243-38.000.

Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; by Zolotarevskaya, Alla Meerovna, administrator; and by Zolotarevskaya, Maiya Vladimirovna, administrator. Ignition system for internal-combustion engines negative bias trigger. 4,037,576, Cl. 123-148.00R.

Alfred Gutmann Gesellschaft fur Maschinenbau: *See—*
Maitra, Sisir Kumar, 4,037,648, Cl. 165-13.000.

Alfred Herbert Limited: *See—*
Harman, Julius, 4,038,591, Cl. 318-578.000.

Allen-Bradley Company: *See—*
Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, 4,038,533, Cl. 235-151.110.

Allen, James Austin, to RCA Corporation. Video disc player apparatus for establishing electrical connection between a stylus electrode and a signal processing circuit. 4,038,682, Cl. 358-128.000.

Allen, Robert R.: *See—*
Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., 4,038,436, Cl. 426-603.000.

Allied Chemical Corporation: *See—*
Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.
O'Handley, Robert Charles; Nesbitt, Ethan Allen; and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.

Allis-Chalmers Corporation: *See—*
Coxhill, Major, 4,037,800, Cl. 241-213.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Larsson, Hans Gunnar, 4,037,305, Cl. 29-421.00R.

Almosnino, Emanuel; and Almosnino, Susan Draisin. Child carrier. 4,037,764, Cl. 224-6.000.

Almosnino, Susan Draisin: *See—*
Almosnino, Emanuel; and Almosnino, Susan Draisin, 4,037,764, Cl. 224-6.000.

Alpura Koreco A.G.: *See—*
Loliger, Willi, 4,037,996, Cl. 417-518.000.

Althoff, Heinz, to Fried, Krupp Gesellschaft mit beschrankter Haftung. Reclaiming and stacking system. 4,037,735, Cl. 214-10.000.

Aluminum Company of America: *See—*
Lewis, Paul R., 4,037,551, Cl. 113-121.00C.

Amano, Takashi: *See—*
Hanyu, Susumu; and Amano, Takashi, 4,037,549, Cl. 112-258.000.

Amazonen-Werke H. Dreyer: *See—*
Dreyer, Heinz, 4,037,545, Cl. 111-85.000.
Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, 4,037,759, Cl. 222-142.000.

Ambruoso, Pasquale, Sr.; and Szalvay, Laszlo, to Motorola, Inc. Acoustic coupling structure for microphone. 4,038,502, Cl. 179-179.000.

Amemiya, Isamu: *See—*
Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, 4,037,828, Cl. 266-271.000.

Amerace Corporation: *See—*
Fleming, Robert S., 4,037,925, Cl. 350-97.000.

American Can Company: *See—*
Meyers, George Leroy; and Pawlowski, Thomas Dominic, 4,037,776, Cl. 229-43.000.
Wallace, Sydney Johnstone, 4,037,329, Cl. 34-4.000.
Zofko, David Edward, 4,037,550, Cl. 113-120.00Y.

American Chain & Cable Company, Inc.: *See—*
Johnson, Richard B., 4,037,738, Cl. 214-38.0CC.

American Cyanamid Company: *See—*
Lies, Thomas Andrew; and Clapp, James Wellington, 4,038,288, Cl. 260-329.00S.
Thompson, Harold Godfred, 4,038,220, Cl. 260-3.000.
Tobkes, Martin, 4,038,315, Cl. 260-559.0AT.
Wright, Donald Perry, Jr., 4,038,403, Cl. 424-269.000.

American Electronic Laboratories, Inc.: *See—*
Van Cleave, James R., 4,038,539, Cl. 235-156.000.

American Home Products Corporation: *See—*
Strike, Donald P., 4,038,308, Cl. 260-514.00D.

American Hospital Supply Corporation: *See—*
Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., 4,038,030, Cl. 23-230.00B.
Huempfner, David F.; and Tringali, Richard C., 4,037,291, Cl. 16-35.00R.

American Lottery Equipment, Inc.: *See—*
Albert, Jack, 4,037,702, Cl. 194-93.000.

American Optical Corporation: *See—*
Dusza, Robert J.; and Kantorski, Joseph W., 4,038,014, Cl. 425-388.000.
Fuller, Henry Edward, Jr., 4,038,666, Cl. 346-136.000.

Amos, Robert Walter James: *See—*
Drake, Cyril Francis; and Amos, Robert Walter James, 4,038,430, Cl. 427-248.00E.

Anchor Hocking Corporation: *See—*
Acton, Daniel D.; and Boerstler, John W., 4,037,747, Cl. 215-219.000.

Anders, Edward O. Offshore drilling structure. 4,037,424, Cl. 61-98.000.

Andersen 2000, Inc.: *See—*
Roth, Thomas P., 4,038,057, Cl. 55-270.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,038,248, Cl. 260-45.75R.

Anderson, Clayton & Co.: *See—*
Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., 4,038,436, Cl. 426-603.000.

Anderson, Donald J., to Chevron Research Company. Method of recovering viscous petroleum from an underground formation. 4,037,658, Cl. 166-272.000.

Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, to Emco Ltd. Pipe coupling. 4,037,864, Cl. 285-342.000.

Anderson, Paul R. Riding toy for children. 4,037,833, Cl. 272-52.000.

Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., to Heil-Quaker Corporation. Air conditioner control. 4,038,061, Cl. 62-126.000.

Anderson, Sidney Elmer, to Deere & Company. Harvester attachment. 4,037,393, Cl. 56-119.000.

Andou, Hiroshi: *See—*
Nakano, Tsunetomo; Nishio, Kazuaki; Hayashi, Toshikazu; and Andou, Hiroshi, 4,038,084, Cl. 96-115.00P.

Andreas, David W.: *See—*
Brandberg, Lawrence C.; and Andreas, David W., 4,038,425, Cl. 426-107.000.

Andreasen, George F., to University of Iowa Research Foundation, The. Method and system for orthodontic moving of teeth. 4,037,324, Cl. 32-14.00A.

Andres, Karlheinz: *See—*
Wagner, Kuno; and Andres, Karlheinz, 4,038,198, Cl. 252-182.000.

Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., to United States of America, Navy. Method for degrading aromatic explosive solutions. 4,038,116, Cl. 149-105.000.

Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, to Imperial Chemical Industries Limited. Device for firing an electric detonator. 4,037,538, Cl. 102-23.000.

Angelo, James F. Pollution free combination carbonization apparatus and furnace. 4,037,543, Cl. 110-14.000.

Angelo, Nicholas C. Meat cooking apparatus. 4,037,580, Cl. 126-25.00R.

Angst, Fritz. Tool holder with fine infeed. 4,037,497, Cl. 82-36.00R.

Anhalt, John W.; and Curley, James H., to International Telephone and Telegraph Corporation. Electrical connector. 4,037,911, Cl. 339-217.00S.

Antrim, Richard Lee; and Harris, Donald Wayne, to Standard Brands Incorporated. Method for treatment of corn hulls. 4,038,481, Cl. 536-56.000.

Anzai, Satoru, to Nippon Kogaku K.K. Reflection type image forming optical system having a large angle of view. 4,037,943, Cl. 350-294.000.

Aoki, Teiji. Audio-visual cartridge and player. 4,037,951, Cl. 353-19.000.

Aoyanagi, Isamu: *See—*
Arakawa, Yoshiaki; Aoyanagi, Isamu; and Matsumoto, Saburo, 4,037,463, Cl. 73-341.000.

Apen, John Robert; and Bray, William Homer, Jr., to Bell Telephone Laboratories, Incorporated. Shielded multipair cable. 4,038,487, Cl. 174-36.000.

Apirina, Evgenia Grigorievna: *See—*
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.

Arai, Haruhiko: *See—*
Minegishi, Yutaka; and Arai, Haruhiko, 4,038,196, Cl. 252-8.800.

Arakawa, Yoshiaki; Aoyanagi, Isamu; and Matsumoto, Saburo, to Showa Denko Kabushiki Kaisha. Temperature-detecting element. 4,037,463, Cl. 73-341.000.

Archibald, John Leheup; and Jackson, John Lambert, to John Wyeth & Brother Limited. Novel indole derivative. 4,038,401, Cl. 424-267.000.

Ardie-Werk, GmbH: *See—*
Prenzel, Karl, 4,037,697, Cl. 192-91.00R.

Arena, Thomas. Nail holding device. 4,037,632, Cl. 145-46.000.

Arevalo, Luis Jorge Velandia. Hand-driven water craft. 4,037,557, Cl. 115-24.000.

Argade, Shyam D.: *See—*
Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., 4,038,365, Cl. 423-161.000.

Arikawa, Yoshiyuki: *See—*
Thatcher, Donald N.; and Arikawa, Yoshiyuki, 4,038,321, Cl. 260-583.00B.

Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,037,637, Cl. 152-352.00R.

Arita, Tomohiko: *See—*
Sekido, Satoshi; and Arita, Tomohiko, 4,038,586, Cl. 361-435.000.

Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, to Audi NSU Auto Union Aktiengeselischaft. Liquid-cooled rotary piston internal combustion engine with housing. 4,037,999, Cl. 418-84.000.

Armstrong, Donald E.: *See—*
Audesse, Emery G.; and Armstrong, Donald E., 4,038,020, Cl. 431-93.000.

Arnold, Bruce K.; and Yamamoto, Stephen K., to International Telephone and Telegraph Corporation. Electrical connector. 4,037,904, Cl. 339-64.00R.

Arnold, Fred E.; and Hedberg, Frederick L., to United States of America, Air Force. Phenylethynyl substituted aromatic diamines. 4,038,320, Cl. 260-578.000.

Asada, Koji: *See—*
Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, 4,037,828, Cl. 266-271.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, 4,038,452, Cl. 428-224.000.

Asaoka, Leo K., to Talley-Frac Corporation. Well-fracturing explosive composition. 4,038,112, Cl. 149-2.000.

ASEA Aktiebolag: *See—*
Stenkvist, Sven Einar, 4,038,483, Cl. 13-11.000.

Ashauer, Karl; and Mihatsch, Hansjorg, to Volkswagenwerk Aktiengesellschaft. Bearing arrangement for axle or shafts provided with rotating gears in a differential gear box. 4,037,492, Cl. 74-710.000.

Ashton, Richard F., to Reynolds Metals Company. Vertical welding of thick aluminum members. 4,038,514, Cl. 219-126.000.

Asplundh Tree Expert Company: *See—*
Moyer, Richard A.; and Patton, Joseph D., 4,037,684, Cl. 182-2.000.

Assaraf, Simon: *See—*
Shabtai, Joseph; and Assaraf, Simon, 4,037,440, Cl. 70-108.000.

Astro: *See—*
Davitz, Daniel M., 4,038,074, Cl. 75-171.000.

Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, to Ciba-Geigy Corporation. Process for the production of poly-N-vinylpyrrolidone granules containing iodide. 4,038,476, Cl. 528-485.000.

Atherton, Robert Allan; and Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader with blade clamping mechanism. 4,037,670, Cl. 172-795.000.

Atkins, Lyle D., to Wallace-Atkins Oil Corporation. Process and apparatus for the destructive distillation of waste material. 4,038,152, Cl. 201-2.500.

Atkins, Thomas Joseph, to Du Pont de Nemours, E. I., and Company. Tricyclic phosphorous triamides. 4,038,312, Cl. 260-551.00P.

Atlantic Richfield Company: *See—*
McCoy, John J.; and Zajacek, John G., 4,038,376, Cl. 423-510.000.

Vorachek, James H.; and Washall, Thomas A., 4,038,375, Cl. 423-510.000.
Washall, Thomas A.; and Morgan, Harry, 4,038,377, Cl. 423-510.000.

Atlas Copco Aktiebolag: *See*—
Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, 4,037,671, Cl. 173-2.000.

Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for the removal of SO_x and NO_x from waste gases using alkali metal or alkaline earth metal iodide. 4,038,367, Cl. 423-235.000.

Atsukawa, Masumi; Shinoda, Naoharu; and Ukawa, Naohiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for removing oxides of nitrogen and sulfur from exhaust gases. 4,038,368, Cl. 423-235.000.

Audesse, Emery G.; and Armstrong, Donald E., to GTE Sylvania Incorporated. Photoflash lamp. 4,038,020, Cl. 431-93.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
Ruf, Max, 4,037,455, Cl. 72-324.000.

Audiometric Teleprocessing, Inc.: *See*—
Feezor, Michael D., 4,038,496, Cl. 179-1.00N.

Auer, Robert Edward; and Tucker, Howard E., to Coulter Electronics, Inc. Method and apparatus for simultaneous optical measurement of particle characteristics. 4,038,556, Cl. 250-575.000.

Austel, Volkhard: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Avco Corporation: *See*—
King, Robert W., 4,038,440, Cl. 428-245.000.

Azelton, Claud: *See*—
Trompeter, Emanuel; Hunter, Tracy A.; and Azelton, Claud, 4,037,909, Cl. 339-177.00R.

Azinger, Frederick A., Jr.: *See*—
Wolf, Charles B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., 4,038,512, Cl. 219-121.00P.

B.C. Investments Ltd.: *See*—
Connelly, Brian W., 4,037,978, Cl. 403-164.000.

B. F. Goodrich Company, The: *See*—
Cohen, Louis, 4,038,473, Cl. 526-62.000.

Baal-Taxa, Baruch. Building structure. 4,037,376, Cl. 52-280.000.

Bachinger, Peter, to International Standard Electric Corporation. Toggle or the like. 4,037,884, Cl. 308-2.00R.

Backman, Ralph H.: *See*—
Sjogren, Christer A.; and Backman, Ralph H., 4,037,525, Cl. 93-93.00C.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Eisele, Wolfgang; Lelgemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, 4,038,229, Cl. 260-29.40R.

Bagrosky, Michael Edward: *See*—
Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, 4,037,752, Cl. 220-70.000.

Bailey, Dennis H.: *See*—
Bailey, Henry E.; Bailey, Dennis H.; and Bailey, Richard E., 4,037,570, Cl. 123-47.00A.

Bailey, Henry E.; Bailey, Dennis H.; and Bailey, Richard E. Stratified charge internal combustion engine. 4,037,570, Cl. 123-47.00A.

Bailey, Richard E.: *See*—
Bailey, Henry E.; Bailey, Dennis H.; and Bailey, Richard E., 4,037,570, Cl. 123-47.00A.

Baker, Alfred Lynn, to RCA Corporation. Defect detection and compensation. 4,038,686, Cl. 358-127.000.

Baker Manufacturing Company: *See*—
Lien, Neil C., 4,037,654, Cl. 166-88.000.

Baker, Robert M. Pick up apparatus. 4,037,868, Cl. 294-19.00R.

Bakun, Paul; and Porter, Clifford. Solar heating system and panels. 4,037,583, Cl. 126-271.000.

Balco Inc.: *See*—
Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., 4,037,374, Cl. 52-179.000.

Baldwin, Stanley H.; and Willoughby, Arnold E., to Abitibi Paper Company Ltd. Short cycle pressed fiberboard manufacturing process. 4,038,131, Cl. 162-103.000.

Baldwin, William I.: *See*—
Buchele, Wesley F.; and Baldwin, William I., 4,037,396, Cl. 56-255.000.

Ball Brothers Research Corporation: *See*—
Loran, Thomas J.; Friebel, Virgil R.; and Pardee, Robert P., 4,038,453, Cl. 428-325.000.
Turner, Edwin M., 4,038,662, Cl. 343-752.000.

Ball, Ervin Matthew, to RCA Corporation. Vacuum tube gas test apparatus. 4,038,616, Cl. 324-20.0CR.

Balliett, John W.: *See*—
Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.

Bally Manufacturing Corporation: *See*—
Hooker, Donald E., 4,037,845, Cl. 273-138.00A.

Balme, Maurice; Gattus, Jean; and Gerard, Bernard, to Rhone-Poulenc S.A. Thixotropic aqueous polyimide compositions. 4,038,450, Cl. 428-268.000.

Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., to Balco Inc. Stair nosing structure. 4,037,374, Cl. 52-179.000.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Bulk reinforced laminated container. 4,037,775, Cl. 229-15.000.

Barbour, William P. Imprinter. 4,037,534, Cl. 101-269.000.

Barcella, Giovanni, to AB Nike Hydraulik. Scissors jack. 4,037,822, Cl. 254-124.000.

Bard, Howard B., to United States of America, Navy. Redundant oscillator for clocking signal source. 4,038,608, Cl. 331-56.000.

Barker, Robert I.: *See*—
King, David P.; and Barker, Robert I., 4,037,968, Cl. 356-160.000.

Barmag Barmer Maschinenfabrik: *See*—
Lenk, Erich, 4,038,005, Cl. 425-190.000.

Barnebey-Cheney Co.: *See*—
Barnebey, Herbert L., 4,038,154, Cl. 202-93.000.

Barnebey, Herbert L., to Barnebey-Cheney Co. Pile furnace. 4,038,154, Cl. 202-93.000.

Barozzi, Dan Alexandru; Calin, Valentin; and Peter, Zsigmond, to Intreprinderea De Radiatoare Si Cabluri. Process for the soldering of the cooler assembly to automobile radiators. 4,037,774, Cl. 228-183.000.

Barr and Stroud Limited: *See*—
Runciman, Herbert Morrison; and Berry, Peter John, 4,037,920, Cl. 350-7.000.

Barton, Lynn R.: *See*—
Borofka, Robert P.; and Barton, Lynn R., 4,038,612, Cl. 331-178.000.

BASF Aktiengesellschaft: *See*—
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.
Hoch, Helmut; and Quadbeck-Seeger, Hans-Juergen, 4,038,309, Cl. 260-520.00A.
Hoffmann, Werner; and von Fraunberg, Karl, 4,038,330, Cl. 260-648.00C.
Kiefer, Hans; and Naarmann, Herbert, 4,038,311, Cl. 260-544.00C.
Weitz, Hans-Martin; and Hartig, Juergen, 4,038,307, Cl. 260-497.00A.

BASF Wyandotte Corporation: *See*—
Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., 4,038,365, Cl. 423-161.000.

Baskov, Jury Alexandrovich: *See*—
Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich, 4,038,353, Cl. 261-89.000.

Bastasch, Frank J., to United Bakery Equipment Company, Inc. Bag supply system for bagging machine. 4,037,388, Cl. 53-64.000.

Bastein, Jens: *See*—
Kresser, Anton; and Bastein, Jens, 4,037,618, Cl. 137-266.000.

Bathke, Heinz: *See*—
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.

Battelle Memorial Institute: *See*—
Moss, Ronald W.; McClanahan, Edwin D., Jr.; and Laegreid, Nils, 4,038,171, Cl. 204-298.000.

Battenfeld Maschinenfabriken GmbH: *See*—
Langecker, Erhard, 4,038,017, Cl. 425-466.000.

Batzer, Hans: *See*—
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 4,038,277, Cl. 260-256.40C.

Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, to Rhone-Poulenc S.A. Fluid fractionation apparatus and method of manufacturing the same. 4,038,190, Cl. 210-321.00B.

Bauer, Werner R.; and Sepso, Roger P., to Robertshaw Controls Company. Method of making fluid operated electrical switch construction. 4,037,317, Cl. 29-622.000.

Bauer, William. Method of playing baseball. 4,037,837, Cl. 273-25.000.

Baukal, Werner; Knodler, Reinhard; and Kuhn, Wolfgang Hermann. Sodium-sulfur battery and process for its production. 4,038,464, Cl. 429-104.000.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Quaternary ammonium carbamide compounds. 4,038,303, Cl. 260-459.00A.

Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, to Ciba-Geigy Corporation. New polyepoxide-polysiloxane compounds. 4,038,338, Cl. 260-824.0EP.

Baumann, Gerhard, to Interhydro A. G. Method and apparatus for increasing the available volume for a nutritive solution contained in a hydroponic receptacle. 4,037,363, Cl. 47-59.000.

Baumann, Martin, to Sperry Rand Corporation. Aiming device for firing on movable targets. 4,038,521, Cl. 235-61.50S.

Baumgartner, Hans R.; and Skrovanek, Stephen D., to Norton Company. Strengthening reaction sintered silicon nitride. 4,038,092, Cl. 106-73.400.

Bausch & Lomb Incorporated: *See*—
Dey, Thomas W., 4,038,542, Cl. 240-92.000.

Baxter Travenol Laboratories, Inc.: *See*—
Macemon, James H., 4,037,960, Cl. 356-73.000.
Macemon, James H., 4,037,961, Cl. 356-85.000.

Bayer Aktiengesellschaft: *See*—
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,038,399, Cl. 424-266.000.
Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, 4,038,340, Cl. 260-861.000.
Hugl, Herbert; and Wolfrum, Gerhard, 4,038,240, Cl. 260-37.00N.
Ippen, Jakob; and Stuttgen, Friedel, 4,037,635, Cl. 152-301.000.
Koster, Johan Bernhard; Meiners, Hans Joachim; and Moretto, Hans Heinrich, 4,038,221, Cl. 260-2.5AH.
Lailach, Gunter, 4,038,364, Cl. 423-86.000.

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,404, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,406, Cl. 424-269.000.
Moritz, Karl Ludwig; and Schundehutte, Karl Heinz, 4,038,268, Cl. 260-156.000.
Pelster, Heinrich; and Beck, Uwe, 4,038,328, Cl. 260-622.00R.
Vernaleken, Hugo; and Hucks, Uwe, 4,038,252, Cl. 260-47.0XA.
Wagner, Kuno; and Andres, Karlheinz, 4,038,198, Cl. 252-182.000.

Bayer, Arthur J.; and Schwarzer, Henry. Skateboard braking method and apparatus. 4,037,852, Cl. 280-87.04A.

Bazin, Lucas John, to RCA Corporation. Apparatus for automatic gamma control of television color signals. 4,038,685, Cl. 358-32.000.

Bazin, Lucas John: *See—*
Schneider, Dennis Michael; and Bazin, Lucas John, 4,038,687, Cl. 358-165.000.

BBC Brown Boveri & Company Limited: *See—*
La Roche, Ulrich, 4,038,028, Cl. 21-102.00R.
Rohr, Franz-Josef, 4,038,462, Cl. 429-30.000.

Beal, Richard Ernest, to BICC Limited. Optical guides with compressible cellular material. 4,037,923, Cl. 350-96.00B.

Beavon, David K., to Ralph M. Parsons Company, The. Apparatus for the production of sulfur from mixtures of hydrogen sulfide and fixed nitrogen compounds. 4,038,036, Cl. 23-262.000.

Beck, Uwe: *See—*
Pelster, Heinrich; and Beck, Uwe, 4,038,328, Cl. 260-622.00R.

Becker, Stephen R.: *See—*
Jacobson, Evan C.; and Becker, Stephen R., 4,037,503, Cl. 84-9.000.

Becking, Paul E., to Data-Link Corporation. Center feed unwinder. 4,037,803, Cl. 242-55.180.

Beckman Instruments, Inc.: *See—*
Guyette, Edward L., 4,037,898, Cl. 339-17.00C.

Beckstead, Donald M. Flexible strap wrench. 4,037,495, Cl. 81-64.000.

Becton, Dickinson and Company: *See—*
Reno, Woodrow James, 4,038,147, Cl. 195-103.50R.

Beiersdorf Aktiengesellschaft: *See—*
Lehmann, G. W. Horst; and Curts, H. A. Julius, 4,038,454, Cl. 428-356.000.

Bell & Howell Company: *See—*
Jamieson, John; and Price, Henry F., 4,037,955, Cl. 355-54.000.
Karsh, Herbert; and Gilchrist, Edgar S., 4,037,767, Cl. 226-7.000.
Pasturczak, Vincent S.; and Kerstein, Melvin T., 4,037,949, Cl. 352-158.000.
Scheib, Harold A., 4,037,954, Cl. 355-50.000.

Bell, Malcolm Charles Evert; Eerkes, Thijs; and Sridhar, Ramamritham, to International Nickel Company, Inc., The. Method of stripping base metals from fused salts. 4,038,066, Cl. 75-29.000.

Bell Telephone Laboratories, Incorporated: *See—*
Apen, John Robert; and Bray, William Homer, Jr., 4,038,487, Cl. 174-36.000.
Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, 4,038,559, Cl. 307-64.000.
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.
Feldman, Martin; and White, Alan David, 4,037,969, Cl. 356-172.000.
Hwang, Frank Kwangming, 4,038,638, Cl. 340-166.00R.
Marr, George; and Smith, George Elwood, 4,038,107, Cl. 148-1.500.
Presby, Herman Melvin, 4,038,062, Cl. 65-2.000.
Reznicek, Kurt, 4,037,749, Cl. 220-2.30R.
Smith, George Elwood, 4,037,307, Cl. 29-571.000.
Smith, George Elwood, 4,037,308, Cl. 29-571.000.
Smith, George Elwood, 4,037,309, Cl. 29-571.000.

Bellamy, John C., II: *See—*
Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., 4,038,497, Cl. 179-15.0AT.

Belleson, James Garman; and Clark, Kendall, to International Business Machines Corporation. Inspection tool. 4,037,941, Cl. 350-285.000.

Belleson, James Garman; and Clark, Kendall, to International Business Machines Corporation. Inspection tool. 4,037,971, Cl. 356-199.000.

Belmares-Sarabia, Hector. Polymerizable ethylenically unsaturated N-substituted 2,2-dihydro carbyl-2,1,3-benzostanna-thiazolines. 4,038,300, Cl. 260-429.700.

Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna. Method of producing thickened electrolyte for primary cell. 4,038,466, Cl. 429-190.000.

Bendszus, Otto: *See—*
Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, 4,038,340, Cl. 260-861.000.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.

Bennett, Richard H.: *See—*
Brockington, James W.; and Bennett, Richard H., 4,038,212, Cl. 252-436.000.

Bennett, Robert R.; and Byerley, Wilbur M., to Westinghouse Electric Corporation. Flow distribution arrangement for a steam generator. 4,037,569, Cl. 122-32.000.

Benson, John O. Continuous grain drier and method. 4,038,021, Cl. 432-112.000.

Benson, Nigel Colin; and Mehta, John Dorab, to Imperial Chemical Industries Limited. Production of thermoplastic films. 4,038,121, Cl. 156-157.000.

Benson, Robert D. Scraper device having receptacle walls heated by engine exhaust. 4,037,336, Cl. 37-124.000.

Beranek, Robert Louis, Jr.; and Timms, Donny Lee, to Johns-Manville Corporation. Method and apparatus for making a fibrous board-like product having a male edge and a female edge. 4,038,356, Cl. 264-160.000.

Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-28086 and process for production thereof. 4,038,384, Cl. 424-122.000.

Berg, Harry, to H. B. Contracting Ltd. Buoyancy apparatus. 4,037,425, Cl. 61-112.000.

Bergougnoux, Rene; and Delafosse, Jacques, to Commissariat a l'Energie Atomique. Plate type nuclear fuel element and a method of fabrication of said element. 4,038,135, Cl. 176-68.000.

Bergvall, Bengt Allan, to Facit Aktiebolag. Thermal printing head. 4,038,516, Cl. 219-216.000.

Berline, Sylvain Dominique Daniel Leonce. Vacuum belt filters. 4,037,338, Cl. 210-77.000.

Berman, Myer. Buoy recovery technique. 4,037,555, Cl. 114-245.000.

Berry, Peter John: *See—*
Runciman, Herbert Morrison; and Berry, Peter John, 4,037,920, Cl. 350-7.000.

Berstermann, Wilhelm: *See—*
Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,962, Cl. 356-86.000.
Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,963, Cl. 356-86.000.

Besozzi, Alfio J.; and Foster, Alan W., to Petro-Tex Chemical Corporation. Purification of unsaturated compounds. 4,038,336, Cl. 260-680.00E.

Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, to International Business Machines Corporation. Terminal assembly. 4,037,912, Cl. 339-198.00R.

Beswick, Paul R. Variable O-ring control valve. 4,037,623, Cl. 137-599.000.

Bethards, Charles William, to Motorola, Inc. Transmitter modulation limiter. 4,038,603, Cl. 325-182.000.

Bharat, Ramasesha. Frequency divider using a charged coupled device. 4,038,565, Cl. 307-225.00C.

Bhasin, Madan Mohan, to Union Carbide Corporation. Supported metal catalyst, methods of making same, and processing using same. 4,038,175, Cl. 208-144.000.

Bibb Company, The: *See—*
Kearney, John A., 4,038,027, Cl. 8-120.000.

BICC Limited: *See—*
Beal, Richard Ernest, 4,037,923, Cl. 350-96.00B.

Bielawski, Timothy: *See—*
Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, 4,038,533, Cl. 235-151.110.

Bigbee, Marvin Lee: *See—*
Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.

Bille, Heinz: *See—*
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.

Billings, John S., Jr.: *See—*
Meyer, Jeffry R.; and Billings, John S., Jr., 4,038,486, Cl. 174-28.000.

Bio-Degradable Plastics, Inc.: *See—*
Swanholm, Carl E.; and Caldwell, Robert G., 4,038,227, Cl. 260-23.00H.

Bio-Medicus, Inc.: *See—*
Rafferty, Edson Howard; and Kletschka, Harold D., 4,037,984, Cl. 415-60.000.

Birch, John R., to G. D. Searle & Co., Limited. Cell culture medium. 4,038,139, Cl. 195-1.800.

Birch, Terrell C.: *See—*
Peng, Ting-fu; and Peng, Eng-Chin, 4,037,359, Cl. 47-14.000.

Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, to Imperial Chemical Industries Limited. Aqueous dispersion of fluorocarbon polymer and halogen-containing complex phosphate of aluminum. 4,038,234, Cl. 260-29.60F.

Bird, Forrest M. Pressure unloading valve device for compressor. 4,037,994, Cl. 417-316.000.

Birney, Richard Eugene; and Davis, Michael Ian, to International Business Machines Corporation. Non-translatable storage protection control system. 4,038,645, Cl. 364-200.000.

Bissel, Dennis Ray: *See—*
Stenson, Derek William; and Bissel, Dennis Ray, 4,038,489, Cl. 174-70.00R.

Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, to Siemens Aktiengesellschaft. Nuclear reactor with suspended fuel assemblies having secondary emergency suspensions. 4,038,133, Cl. 176-38.000.

Bjornson, Geir; and Walters, Harold C., to Phillips Petroleum Company. Acid anhydride to react with impurities in the production of perfluorocarboxylic acids. 4,038,310, Cl. 260-539.00A.

Blackman, Calvin C. In-furnace recuperator. 4,038,022, Cl. 431-166.000.

Blackman, Morris V.; and Jenner, Michael D., to U.S. Philips Corporation. Methods of manufacturing infra-red detector elements. 4,037,311, Cl. 29-593.000.

Blair, Stephen A.: *See—*
Medlin, Eric G.; Blair, Stephen A.; and Dennis, Richard H., 4,037,856, Cl. 280-446.00B.

Blanc, Rene: *See*—
Hennart, Claude; and Blanc, Rene, 4,037,352, Cl. 43-129.000.
Hennart, Claude; Dulat, Marcel; and Blanc, Rene, 4,037,353, Cl. 43-129.000.

Block Engineering, Inc.: *See*—
Hirschfeld, Tomas, 4,037,760, Cl. 222-145.000.
Varano, Antonio; and Tobias, Reginald, 4,038,055, Cl. 55-197.000.

Blumenthal, Oreste, to S.p.A. Giuseppe Ratti Industria Ottica. Flexible bar for spectacle-frames. 4,037,946, Cl. 351-114.000.

Bocharova, Svetlana Leonidovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Gas discharge display device having offset electrodes. 4,038,577, Cl. 313-188.000.

Boden, Karl; and Geweke, Werner, to Padana AG. Bearings. 4,037,886, Cl. 308-10.000.

Boehm, Vicky Williams; and Broyde, Barret, to Western Electric Company, Inc. Reclamation processing of polyvinyl chloride-scrap materials and products produced thereby. 4,038,219, Cl. 260-2.300.

Boehringer Ingelheim GmbH: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.

Boehringer Mannheim G.m.b.H.: *See*—
Jaworek, Dieter; Maier, Joseph; and Nelbock-Hochstetter, Michael, 4,038,140, Cl. 195-63.000.

Boeing Company, The: *See*—
James, Varnell L., 4,038,118, Cl. 156-143.000.
Laird, George William, 4,037,988, Cl. 416-141.000.

Boerstler, John W.: *See*—
Acton, Daniel D.; and Boerstler, John W., 4,037,747, Cl. 215-219.000.

Bogert, David L.: *See*—
Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.

Bolger, Bernard J.: *See*—
O'Sullivan, Denis J.; and Bolger, Bernard J., 4,038,345, Cl. 260-881.000.

Boll, Dietmar: *See*—
Reis, Walter; and Boll, Dietmar, 4,037,731, Cl. 214-1.0BB.

Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, to Rowenta-Werke GmbH. Element guards for electric toasters. 4,038,520, Cl. 219-521.000.

Bolt Associates, Inc.: *See*—
Chelminski, Stephen V., 4,038,630, Cl. 340-7.00R.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,037,669, Cl. 172-59.000.

Bondarenko, Raisa Ivanovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Bondi, Herman H. Molding composition. 4,038,094, Cl. 106-99.000.

Booth, William M.; and Rieth, James E., to Reith, James E. Trolling apparatus. 4,037,326, Cl. 33-139.000.

Borg-Warner Corporation: *See*—
Ivey, John Saxon, 4,037,691, Cl. 192-3.310.
Poklacki, Erwin Sigmund; and Kalnajs, Reinis, 4,038,207, Cl. 252-316.000.
Roberts, Richard W., 4,037,993, Cl. 417-222.000.

Borofka, Robert P.; and Barton, Lynn R., to International Telephone and Telegraph Corporation. Swept oscillator automatic linearizer. 4,038,612, Cl. 331-178.000.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine carboxylic acid esters useful as coronary vessel dilators and anti-hypertensives. 4,038,399, Cl. 424-266.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodepositable compositions. 4,038,166, Cl. 204-181.000.

Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodepositable compositions containing sulfonium resins and capped polyisocyanates. 4,038,232, Cl. 260-29.6TA.

Bost, John D.: *See*—
Williams, Tudor; and Bost, John D., 4,038,063, Cl. 65-22.000.

Boswell, Kay H.: *See*—
Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., 4,038,480, Cl. 536-27.000.

Bott, John A. License plate holder. 4,037,342, Cl. 40-209.000.

Bottos, Bela. Brush for cleaning whitewall tires. 4,037,285, Cl. 15-160.000.

Bougain, Georges, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Coupling device for gas turbine engine. 4,037,404, Cl. 60-223.000.

Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, to International Business Machines Corporation. Common polling logic for input/output interrupt or cycle steal data transfer requests. 4,038,641, Cl. 364-900.000.

Bouknecht, Max Abbott; Davis, Michael Ian; and Vergari, Louis Peter, to International Business Machines Corporation. Input/output interface logic for concurrent operations. 4,038,642, Cl. 364-900.000.

Bourgraf, Elroy E.; and Self, Kenneth R., to Ferno-Washington, Inc. Multiple purpose ambulance cot with removable stretcher top. 4,037,871, Cl. 296-20.000.

Bourke, Donall Garraid: *See*—
Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, 4,038,641, Cl. 364-900.000.

Bourque, Rene, to Garcia Corporation. Mold filling system. 4,037,758, Cl. 222-134.000.

Bouwhuis, Gijsbertus; and Velzel, Christiaan Hendriks Frans, to U.S. Philips Corporation. Apparatus for reading an optically recorded record carrier provided with periodic surface undulations and for deriving a focussing control signal from such surface undulations. 4,038,679, Cl. 358-127.000.

Bove, Ronald; and Hubacher, Eric M., to International Business Machines Corporation. High density wafer contacting and test system. 4,038,599, Cl. 324-158.00F.

Bowling, Leslie. Automated bailing apparatus in flexible combination for bailing shallow wells. 4,037,662, Cl. 166-311.000.

Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., to Leffingwell Chemical Company. Protection of horticultural growth. 4,038,385, Cl. 424-166.000.

Box, Theodor M. Transport-display case. 4,037,750, Cl. 220-4.00E.

Boxall, Frank S. Central office switching system with remote line switch. 4,038,498, Cl. 179-18.0FC.

Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., to Corning Glass Works. Composite glass articles spontaneous opal glass and enamel of Li_2O-B_2O_3-TiO_2-ZrO_2-PbO-SiO_2. 4,038,448, Cl. 428-212.000.

Boyes, Bryan; and Jones, Alan, to Imperial Chemical Industries Inc. Manufacture of synthetic filaments. 4,038,357, Cl. 264-168.000.

Boyle, Kenneth E. Universal bag support. 4,037,778, Cl. 229-55.000.

Bradford, George J., to International Telephone and Telegraph Corporation. Reduced outside air capability for unit ventilators. 4,037,783, Cl. 236-49.000.

Braginski, Aleksander I.; and O'Keeffe, Terence W., to Westinghouse Electric Corporation. Hard magnetic bubble domain analog multiplier. 4,038,541, Cl. 235-194.000.

Braig, Siegfried: *See*—
Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.

Braitinger, Helmut: *See*—
Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, 4,037,730, Cl. 214-1.0BB.

Brandau, Justus, to Thyssen Industrie Aktiengesellschaft. Container closure, especially for mixing containers. 4,037,753, Cl. 220-211.000.

Brandberg, Lawrence C.; and Andreas, David W., to Pillsbury Company, The. Combined popping and shipping package for popcorn. 4,038,425, Cl. 426-107.000.

Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., to Libbey-Owens-Ford Company. Radiation shields for aspirating pyrometers. 4,038,105, Cl. 136-231.000.

Brandenberger, Stanley G.: *See*—
McClure, James D.; and Brandenberger, Stanley G., 4,038,213, Cl. 252-430.000.

Bratchell, Robert Lyndon, to Concrete Industries (Monier) Limited. Production method and means for concrete articles. 4,038,355, Cl. 264-157.000.

Braune, Rudi Helmut. Vehicle chassis structure. 4,037,678, Cl. 180-11.000.

Bray, William Homer, Jr.: *See*—
Apen, John Robert; and Bray, William Homer, Jr., 4,038,487, Cl. 174-36.000.

Bremer, Donald. Protective packaging for bottles. 4,037,722, Cl. 206-523.000.

Bremer, Horst, to Gunther Papenmeier KG Maschinen-und Apparatebau. Apparatus for production of granulated and pulverized particles from pasty or similar material. 4,038,010, Cl. 425-314.000.

Bresler, Albert E. Razor adapted for surgical preparation. 4,037,322, Cl. 30-53.000.

Breslow, Jeffrey D., to Marvin Glass & Associates. Target device for pinball games. 4,037,842, Cl. 273-127.00R.

Bresnahan, Alfred E.: *See*—
Di Maio, Anthony E.; Bresnahan, Alfred E.; and Todisco, Joseph G., 4,037,448, Cl. 72-114.000.

Breton, Jacques Leon Georges. Apparatus for the generation of negative or positive atmospheric ions. 4,038,583, Cl. 361-230.000.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc.

[[[(2,4-Dioxo-1-imidazolidinyl)amino]-carbonyl]amino]acetylpenicillin derivatives. 4,038,271, Cl. 260-239.100.

Brewer, Gerald L.; and Olsen, Steven D., to UOP Inc. Method and means for controlling the incineration of waste. 4,038,032, Cl. 23-230.00A.

Brewster, Arthur Edward, to International Standard Electric Corporation. Train position indicator. 4,038,653, Cl. 343-6.80R.

Bricot, Claude; Hareng, Michel; and Spitz, Erich, to Thomson-Brandt. Optical projection device and an optical reader incorporating this device. 4,037,929, Cl. 350-160.0LC.

Bricot, Claude: *See*—
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Bridgestone Tire Company Limited: *See*—
Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.

Bridigum, Robert J., to Westinghouse Air Brake Company. Emergency brake valve device for propogating an emergency brake application. 4,037,880, Cl. 303-82.000.

Briggs, George S.; and Snider, Hugh H., Jr., to United States of America, Navy. Fuze activation device. 4,037,517, Cl. 89-1.50D.

Briggs & Stratton Corporation: *See*—
Harkness, Joseph R., 4,037,389, Cl. 56-11.300.

Brilloit, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Freeze-drying apparatus. 4,037,331, Cl. 34-92.000.

Brindell, Gordon D.; and Macander, Rudy F., to Quaker Oats Company, The. 3,5-Disubstituted-4-hydroxybenzyl derivative. 4,038,327, Cl. 260-619.00R.

Brinker, Reiner G. Multifunctional tool for rescue work. 4,037,276, Cl. 7-6.000.

Bristol Products, Inc.: *See*—
Turner, Larry G.; and Crawford, Dennis W., 4,037,624, Cl. 137-615.000.

Bristol, Thomas W.: *See*—
Chapman, Charles Weldon; and Bristol, Thomas W., 4,038,614, Cl. 333-30.00R.

Bristoline Inc.: *See*—
Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, 4,037,587, Cl. 128-2.05G.

British Petroleum Company Limited, The: *See*—
Topham, William Henry, 4,037,475, Cl. 73-422.00R.

British Syphon Industries Limited: *See*—
Green, David William, 4,037,757, Cl. 222-129.200.

Britzius, George Edward. Adapter unit for converting a two-wheel drive vehicle to a four-wheel drive vehicle. 4,037,429, Cl. 64-4.000.

Brock, Alan James: *See*—
Mullett, Leslie Fred; and Brock, Alan James, 4,037,791, Cl. 239-542.000.

Brock, Phillip J.: *See*—
Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., 4,038,415, Cl. 424-317.000.

Brock, Wayne C. Flame resistant insulation blanket. 4,038,447, Cl. 428-72.000.

Brockington, James W.; and Bennett, Richard H., to Texaco Inc. Alkylation process for production of motor fuels. 4,038,212, Cl. 252-436.000.

Brockley, Christopher A.: *See*—
Davis, Harold R.; Brockley, Christopher A.; Parkinson, Geoffrey V.; and Price, John D. E., 4,038,191, Cl. 210-321.00B.

Brodie, Peter Michael; and Solov, Edwin George, to Singer Company, The. Simplified strapped down inertial navigation utilizing bang-bang gyro torquing. 4,038,527, Cl. 235-150.250.

Broehl, Anton: *See*—
Thaeter, Hans; and Broehl, Anton, 4,037,823, Cl. 254-172.000.

Broken Hill Proprietary Company Limited, The: *See*—
Kemlo, Kenneth Garry; and Gregory, Clive Allen, 4,037,761, Cl. 222-590.000.

Brooks, Fred A., Jr., to Exxon Production Research Company. Cement composition for high temperature wells and methods for producing the same. 4,038,093, Cl. 106-93.000.

Brooks, Philip W.: *See*—
Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.

Brooks, Robert J.: *See*—
Roberts, Harold G.; and Brooks, Robert J., 4,037,725, Cl. 209-122.000.

Brown, Frederick L.; and Potter, James L., to Dow Chemical Company, The. Compositions comprising polyalkylenepolyamines and a mixture of mono- and diammonium phosphates as fire retardants for cellulosic substrates. 4,038,451, Cl. 428-274.000.

Brown & Williamson Tobacco Corporation: *See*—
Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.

Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., to Acme Visible Records, Inc. Locking letter tray. 4,037,780, Cl. 232-31.000.

Broyde, Barret: *See*—
Boehm, Vicky Williams; and Broyde, Barret, 4,038,219, Cl. 260-2.300.

Brugger, Hans. Solar heat storage system. 4,037,652, Cl. 165-45.000.

Brunetti, Heimo: *See*—
Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.

Brutcher, Donald W., to Lipe-Rollway Corporation. Accumulator for object feeder. 4,037,710, Cl. 198-443.000.

Bruzzese, Tiberio; and Ferrari, Rodolfo, to SPA-Societe Prodotti Antibiotici S.p.A. Alkyl esters of polyene antibiotics. 4,038,382, Cl. 424-117.000.

Buchel, Karl Heinz: *See*—
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,404, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,406, Cl. 424-269.000.

Buchele, Wesley F.; and Baldwin, William I., to Iowa State University Research Foundation, Inc. Blade guard for rotary lawn mowers. 4,037,396, Cl. 56-255.000.

Bucher-Guyer AG Maschinenfabrik: *See*—
Hartmann, Eduard, 4,038,004, Cl. 425-150.000.

Buchman, Smil. Method for well exploitation. 4,037,663, Cl. 166-314.000.

Budzich, Tadeusz. Load responsive control valve with constant leakage device. 4,037,621, Cl. 137-596.130.

Building Components Research, Inc.: *See*—
Wahlquist, Carl D., 4,037,385, Cl. 52-745.000.

Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., to Scott Paper Company. Apparatus for controlling the angular orientation of the end of a rolled web. 4,038,127, Cl. 156-353.000.

Bumgardner, Jon H., to United States of America, Navy. Means for real-time laser source characterization. 4,037,959, Cl. 356-73.000.

Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., to Texaco Inc. Fluidized cracking catalyst regeneration apparatus. 4,038,038, Cl. 23-288.00B.

Burgert, Herwig. Loop reactor for chemical processes. 4,037,825, Cl. 259-4.00R.

Burke, George K.: *See*—
LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, 4,037,596, Cl. 128-214.00C.

Burkley, Harold W.; and Geno, Wayne H., to United States of America, Navy. Method of making fuses. 4,037,318, Cl. 29-623.000.

Burris, Robert E.; and Adams, Lester E., to Prime Manufacturing Corporation. Electronic digital gauge. 4,038,532, Cl. 235-151.300.

Burron Medical Products, Inc.: *See*—
LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, 4,037,596, Cl. 128-214.00C.

Burroughs Corporation: *See*—
Kim, Dongsung Robert, 4,038,643, Cl. 364-200.000.
Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.
Marr, George; and Smith, George Elwood, 4,038,107, Cl. 148-1.500.
Semmelhaack, Carl Frederick; and DiVecchio, Mark Camillo, 4,038,538, Cl. 235-154.000.

Burroughs Wellcome Co.: *See*—
Elion, Gertrude B.; and Strelitz, Robert A., 4,038,479, Cl. 536-24.000.

Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, to Du Pont de Nemours, E. I., and Company. Electrochemical generation of field desorption emitters. 4,038,158, Cl. 204-23.000.

Bycroft, George William: *See*—
Thorp, Peter; and Bycroft, George William, 4,037,862, Cl. 285-260.000.

Byerley, Wilbur M.: *See*—
Bennett, Robert R.; and Byerley, Wilbur M., 4,037,569, Cl. 122-32.000.

C L Industries, Inc.: *See*—
Kloster, William R.; and Stewart, Patrick H., 4,037,645, Cl. 164-161.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,037,669, Cl. 172-59.000.

Cabaud, Aime, to COMATEL - Comptoir Europeen de Materiel Electronique. Electrical connector strips. 4,037,915, Cl. 339-258.00P.

Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno. Apparatus for storing and feeding yarn to yarn using machines. 4,037,802, Cl. 242-47.050.

Caldwell, Robert G.: *See*—
Swanholm, Carl E.; and Caldwell, Robert G., 4,038,227, Cl. 260-23.00H.

Calgon Corporation: *See*—
Noren, Gerry K.; and Diehl, Richard C., 4,038,176, Cl. 208-180.000.

Calin, Valentin: *See*—
Barozzi, Dan Alexandru; Calin, Valentin; and Peter, Zsigmond, 4,037,774, Cl. 228-183.000.

Caliri, Frank. Automobile warning system. 4,038,634, Cl. 340-52.00F.

Callahan, George Edgar, to Naumann, Helmut. Device for measuring the density of liquids. 4,037,481, Cl. 73-454.000.

Cambridge Memories, Inc.: *See*—
Lin, Paul T., 4,038,488, Cl. 174-52.0FP.

Cameron, Anson W. Clamp for garment racks. 4,037,728, Cl. 211-124.000.

Campbell, Murray Robert. Floor maintenance brush. 4,037,369, Cl. 51-400.000.

Campbell, Robert W.; and Edmonds, James T., Jr., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,038,259, Cl. 260-79.100.

Campbell, Robert W., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,038,260, Cl. 260-79.100.

Campbell, Robert W.: *See—*
Edmonds, James T., Jr.; and Campbell, Robert W., 4,038,263, Cl. 260-79.100.

Campbell Soup Company: *See—*
Hildebolt, William M., 4,038,431, Cl. 426-511.000.
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.

Canada, Her Majesty the Queen in Right of: *See—*
Kuehn, Lorne; and Seigel, Harold O., 4,037,328, Cl. 33-349.000.

Canadian Patents and Development Limited: *See—*
Clarke, Michael R.; and Rak, Jaromir R., 4,038,086, Cl. 106-15.00R.

Canon Kabushiki Kaisha: *See—*
Minoura, Kazuo, 4,037,937, Cl. 350-184.000.
Momiyama, Kikuo, 4,037,935, Cl. 350-176.000.
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
Sone, Yoshiaki; and Shirai, Masanari, 4,037,953, Cl. 355-45.000.

Cantaloupe, Francis A.: *See—*
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.

Cantone, Natale. Agricultural machine. 4,037,544, Cl. 111-6.000.

Carasso, Marino Giuseppe: *See—*
Hoeberechts, Arthur Marie Eugene; and Carasso, Marino Giuseppe, 4,038,606, Cl. 328-124.000.

Cargill Detroit Corporation: *See—*
Sampson, Sheldon E.; and Cargill, Don A., 4,037,447, Cl. 72-92.000.

Cargill, Don A.: *See—*
Sampson, Sheldon E.; and Cargill, Don A., 4,037,447, Cl. 72-92.000.

Carlton, Lewis M.: *See—*
Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.

Carnahan, James R.: *See—*
Newsom, William D.; and Carnahan, James R., 4,037,660, Cl. 166-302.000.

Carnahan, Robert D.: *See—*
Hou, Shou L.; and Carnahan, Robert D., 4,038,667, Cl. 346-140.00R.

Carpenter, Neil L., to Electroflood Company. Method for secondary recovery of oil. 4,037,655, Cl. 166-248.000.

Carr, Larry R., to Optronix Inc. Light sensitive device for measuring particles in a liquid. 4,037,973, Cl. 356-206.000.

Carre, Bernard: *See—*
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, to Alcan Research and Development Limited. Production of alumina. 4,038,039, Cl. 23-293.00R.

Carter, C. O., to Phillips Petroleum Company. Separation of ethyl fluoride. 4,038,332, Cl. 260-653.000.

Carver, Harold E.: *See—*
Pownall, John R.; and Carver, Harold E., 4,037,736, Cl. 214-23.000.

Casanovas, Lorenzo Puig; and Vellas, Jean Leon Justin, to Societe d'Etudes et de Diffusion de Procedes et Brevets S.A. Process for the treatment by metallic ions of aqueous liquids and device for making the same. 4,038,163, Cl. 204-152.000.

Casio Computer Co., Ltd.: *See—*
Hakata, Masayuki, 4,038,564, Cl. 307-205.000.

Caspari, Gunter, to Standard Oil Company (Indiana). s-Triazine derivatives as multi-functional additives for lubricating oils. 4,038,197, Cl. 252-46.700.

Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., to Honeywell Information Systems, Inc. Apparatus for verifying the integrity of information stored in a data processing system memory. 4,038,537, Cl. 235-153.0AM.

Cassidy, John Edward: *See—*
Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, 4,038,234, Cl. 260-29.60F.

Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. Method for preparing high-cis polyalkenamers. 4,038,471, Cl. 526-142.000.

Catco Venture: *See—*
Schoofs, Richard J., 4,038,209, Cl. 252-419.000.

Caterpillar Tractor Co.: *See—*
Atherton, Robert Allan; and Cole, Carroll Richard, 4,037,670, Cl. 172-795.000.
Cole, Carroll Richard, 4,037,365, Cl. 51-97.00R.
Goloff, Alexander, 4,037,998, Cl. 418-83.000.
Morge, Michael P., 4,037,293, Cl. 16-171.000.
Sommars, Mark F., 4,037,575, Cl. 123-140.0MC.

Cecchi, Georges: *See—*
Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.

Celanese Corporation: *See—*
Stautzenberger, Adin Lee; and Wagner, Frank Stevens, 4,038,394, Cl. 424-251.000.

Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Mixture of antibiotics produced by a species of actinoplanes. 4,038,383, Cl. 424-119.000.

Centre Electronique Horloger S.A.: *See—*
Porret, Francis, 4,038,580, Cl. 313-498.000.

Centri-Spray Corporation: *See—*
Koepke, Frederick W., 4,037,714, Cl. 198-750.000.

Century 21 Pollution Control, Inc.: *See—*
Diachuk, Wolodymyr; and Palm, Reuben N., 4,038,056, Cl. 55-238.000.

Ceskoslovenska akademie ved: *See—*
Stehlicek, Jaroslav; and Sebenda, Jan, 4,038,470, Cl. 526-29.000.

Cessna Aircraft Company, The: *See—*
Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., 4,037,410, Cl. 60-445.000.

ChaBakKuk. Educational and topological toys, packaging, key, jewel, floating gear, architecture and geodesics, space mechanics and visual eye therapy devices. 4,037,354, Cl. 46-1.00L.

Chabardes, Pierre; and Julia, Marc, to Rhone-Poulenc S.A. Alkenyl aryl sulfones. 4,038,323, Cl. 260-607.0AR.

Chalus, Bernard: *See—*
Michaud, Andre; and Chalus, Bernard, 4,037,703, Cl. 194-97.00R.

Champ, Robert Bruce; and Shattuck, Meredith David, to International Business Machines Corporation. Visual image display device. 4,037,928, Cl. 350-160.00R.

Champion International Corporation: *See—*
Schillinger, Joseph F., 4,037,721, Cl. 206-434.000.

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of a modified plant protein with improved color and flavor. 4,038,437, Cl. 426-656.000.

Chantland, Gilbert S. Spinning hoop. 4,037,356, Cl. 46-47.000.

Chapman, Charles Weldon; and Bristol, Thomas W., to Hughes Aircraft Company. Fractional efficiency coupler. 4,038,614, Cl. 333-30.00R.

Chapman, James W.: *See—*
Gamble, James R.; and Chapman, James W., 4,038,491, Cl. 174-153.00R.

Chapman, Philip Howard: *See—*
Walker, Derek; and Chapman, Philip Howard, 4,038,469, Cl. 526-19.000.

Charles, Fred J. Building panel. 4,037,381, Cl. 52-627.000.

Charles, Herbert N.; and Lie, George K., to Fram Corporation. Flexible bladed fan with increased natural frequency. 4,037,987, Cl. 416-132.00A.

Charlton, John Stuart, to Imperial Chemical Industries Limited. Level and interface detection. 4,038,548, Cl. 250-357.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Airgun marine seismic survey streamer method and apparatus. 4,038,630, Cl. 340-7.00R.

Chemetron Corporation: *See—*
Kuntz, William H.; and Moore, Donald G., 4,037,479, Cl. 73-432.00R.
Towle, Jack Lewis; and Vander Ploeg, John Herman, 4,038,226, Cl. 260-22.0CQ.

Cheplanov, Vyacheslav Ivanovich: *See—*
Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Chernak, John A., to Tomlinson Industries, Inc. Pinch tube valve. 4,037,817, Cl. 251-7.000.

Chesley, Gilman D. Self-configurable circuit structure for achieving wafer scale integration. 4,038,648, Cl. 340-173.00R.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.

Chevron Research Company: *See—*
Anderson, Donald J., 4,037,658, Cl. 166-272.000.
Graf, Peter E.; and Schmidt, Robert J., 4,038,096, Cl. 106-277.000.

Chiesa, Peter Jordan, Jr., to Philadelphia Suburban Corporation. Fire fighting compositions. 4,038,195, Cl. 252-3.000.

Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery potential detecting circuitry. 4,037,399, Cl. 58-23.0BA.

Chilman, John Alfred, to Dowty Rotol Limited. Bladed rotors having control means for effecting blade pitch adjustment. 4,037,986, Cl. 416-46.000.

Chiodi, Wayne R.; and Grummon, Bryan R., to Zenith Radio Corporation. Precision vertical deflection coil for a hybrid television yoke. 4,038,621, Cl. 335-213.000.

Chloride Group Limited: *See—*
Foulkes, Stanley Charles, 4,037,630, Cl. 141-1.100.

Cho, Yung L.: *See—*
Kim, Chung K.; and Cho, Yung L., 4,038,157, Cl. 204-16.000.

Chow, Sen-Te; and Thomas, Earl M., to United States of America, Army. Automatic low frequency gain limiting by addition method in video processing system. 4,038,688, Cl. 358-174.000.

Christe, Karl O., to Rockwell International Corporation. Stable chlorine trifluoride dioxide. 4,038,374, Cl. 423-466.000.

Christensen, Richard L.: *See—*
Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., 4,038,497, Cl. 179-15.0AT.

Christopher, Albert S.; and Tufts, Robert J. Implosion rotary engine. 4,037,415, Cl. 60-673.000.

Chromium Industries, Inc.: *See—*
Scannell, William G., 4,038,085, Cl. 106-1.000.

Chubb, Talbot A. Energy storage-boiler tank using salt fusion and heat piping. 4,037,579, Cl. 126-400.000.

Chubukov, Vladimir Kazimirovich: *See—*
Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich, 4,038,353, Cl. 261-89.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.

Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, to Bell Telephone Laboratories, Incorporated. Regulated uninterruptible power supply. 4,038,559, Cl. 307-64.000.

Chuvpilo, Albert Vladimirovich: *See—*
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.

Ciba-Geigy AG: *See—*
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 4,038,277, Cl. 260-256.40C.

Ciba-Geigy Corporation: *See—*
Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, 4,038,476, Cl. 528-485.000.
Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.
Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.
Habermeier, Jurgen, 4,038,255, Cl. 260-75.00N.
Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, 4,038,241, Cl. 260-39.00P.
Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,038,414, Cl. 424-304.000.
Knell, Martin; and Dexter, Martin, 4,038,246, Cl. 260-45.9NC.
Lind, Hanns, 4,038,250, Cl. 260-45.85B.
Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.
Randell, Donald Richard; and Smith, Malcolm John, 4,038,280, Cl. 260-293.840.
Spivack, John D.; and Luzzi, John J., 4,038,249, Cl. 260-45.75R.
Wilhelm, Max, 4,038,313, Cl. 260-553.00A.

Cincinnati Electronics Corporation: *See—*
Koerber, Clement J., 4,038,604, Cl. 325-363.000.

Cincinnati Milacron, Inc.: *See—*
Dawson, James Earl, 4,038,015, Cl. 425-451.700.

Ciofalo, Anne Louise. Luminous safety device. 4,038,552, Cl. 250-462.000.

Clapp, James Wellington: *See—*
Lies, Thomas Andrew; and Clapp, James Wellington, 4,038,288, Cl. 260-329.00S.

Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., to Allied Chemical Corporation. Foliar applications of urea-polyphosphate-potassium solutions to crops. 4,038,064, Cl. 71-29.000.

Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, to RCA Corporation. Radar contour edge restore circuit. 4,038,655, Cl. 343-5.00W.

Clark Equipment Company: *See—*
Shealy, Noah Alvin, 4,037,696, Cl. 192-48.500.

Clark, Kendall: *See—*
Belleson, James Garman; and Clark, Kendall, 4,037,941, Cl. 350-285.000.
Belleson, James Garman; and Clark, Kendall, 4,037,971, Cl. 356-199.000.

Clark, Robert L.: *See—*
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.

Clarke Chapman Limited: *See—*
Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.

Clarke, Michael R.; and Rak, Jaromir R., to Canadian Patents and Development Limited. Aqueous ammoniacal zinc arsenic or zinc-/copper arsenic wood preservative solutions. 4,038,086, Cl. 106-15.00R.

Clarke, Patrick William: *See—*
Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, 4,038,559, Cl. 307-64.000.

Clausen, Anthony Robin. Container support and holder. 4,037,814, Cl. 248-311.100.

Claxton, George P.: *See—*
Grisar, J. Martin; and Claxton, George P., 4,038,412, Cl. 424-280.000.

Claypoole, Stewart A., to Corning Glass Works. Optical waveguide cable. 4,037,922, Cl. 350-96.00B.

Cleaver, David Frederick, to Paterson Zochonis & Company Limited. Antimicrobial compositions. 4,038,388, Cl. 424-227.000.

Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Certain 2-hydroxy-2,4-diaryl-3-furanones. 4,038,289, Cl. 260-347.300.

Clegg, Giles C., Jr.: *See—*
Tate, George W., Jr., 4,037,593, Cl. 128-146.200.

Clement, Gilbert-Louis, to Infranor S.A. Machine tools. 4,037,982, Cl. 408-61.000.

Clement, Ralph C., to I-T-E Imperial Corporation. Field installed fuse rejection means with spring between clip jaws. 4,037,917, Cl. 339-259.00F.

Clements, Lloyd W. Irrigation pipe joint lock. 4,037,859, Cl. 285-5.000.

Coal Industry (Patents) Limited: *See—*
Robinson, Joseph Gordon; and Rogers, Edward Aubrey, 4,038,236, Cl. 260-32.80R.
Thorp, Peter; and Bycroft, George William, 4,037,862, Cl. 285-260.000.

Coaltex, Inc.: *See—*
Justice, James Conley, 4,037,875, Cl. 299-31.000.

Cochran, Michael J.: *See—*
Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.

Cohen, Louis, to B. F. Goodrich Company, The. Process for cleaning polymerization reactors. 4,038,473, Cl. 526-62.000.

Cole, Carroll Richard, to Caterpillar Tractor Co. Apparatus for cutting arcuately-shaped worms. 4,037,365, Cl. 51-97.00R.

Cole, Carroll Richard: *See—*
Atherton, Robert Allan; and Cole, Carroll Richard, 4,037,670, Cl. 172-795.000.

Cole, Ralph V.: *See—*
Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.

Coleman, Harold R.: *See—*
Rahman, Matiur; and Coleman, Harold R., 4,038,438, Cl. 427-385.00R.

Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 4,038,303, Cl. 260-459.00A.
Cordon, Martin, 4,038,380, Cl. 424-49.000.

Colli, Albert J., to United States of America, Navy. Process for manufacturing chloramine. 4,038,372, Cl. 423-413.000.

Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L. Hardwired marker for time folded TST switch with distributed control logic and automatic path finding, set up and release. 4,038,497, Cl. 179-15.0AT.

Collins, David R.; and Katz, Sheldon N., to Replacement Products Industries Corporation. Window frame. 4,037,378, Cl. 52-397.000.

Collins, Stephen M.: *See—*
Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., 4,038,365, Cl. 423-161.000.

Columbia Research Corporation: *See—*
Craig, Dwin R., 4,038,554, Cl. 250-572.000.

Colwell, Richard Rial: *See—*
Necker, Carl George; and Colwell, Richard Rial, 4,037,462, Cl. 73-32.00R.

COMATEL - Comptoir Europeen de Materiel Electronique: *See—*
Cabaud, Aime, 4,037,915, Cl. 339-258.00P.

Combette, Marc: *See—*
Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.

Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 4,038,024, Cl. 431-202.000.

Commissariat a l'Energie Atomique: *See—*
Bergougnoux, Rene; and Delafosse, Jacques, 4,038,135, Cl. 176-68.000.
Gallet, Bernard; and Venot, Robert, 4,038,136, Cl. 176-87.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Evans, John James Alexander; and Holan, George, 4,038,405, Cl. 424-269.000.

Compagnie Generale d'Electricite S.A.: *See—*
Jacquelin, Jean, 4,038,458, Cl. 429-15.000.

Compagnie Generale des Etablissements Michelin: *See—*
Pflieger, Bernard; and Reiniche, Andre, 4,038,109, Cl. 148-12.00F.

Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., to International Harvester Company. Radiation pyrometers with purging fluid. 4,037,473, Cl. 73-346.000.

Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
Pross, Wilhelm, 4,037,972, Cl. 356-206.000.

Concrete Industries (Monier) Limited: *See—*
Bratchell, Robert Lyndon, 4,038,355, Cl. 264-157.000.

Connelly, Brian W., to B.C. Investments Ltd. Resilient swivel connector. 4,037,978, Cl. 403-164.000.

Conner, Donald E.; and Fogel, Arnold W., to Van Dyk & Company, Incorporated. Fatty halo alkanoate quaternaries of dialkylaminopropylamides. 4,038,294, Cl. 260-404.500.

Conners, Richard C.: *See—*
Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., 4,037,298, Cl. 29-25.420.

Connolly, Thomas M.; and Luoma, Eino J., to United States of America, Army. Microwave absorbers. 4,038,660, Cl. 343-18.00A.

ConTech Inc.: *See—*
Coyner, Robert N.; and Skujins, Peter, 4,038,239, Cl. 260-33.6UB.

Conwed Corporation: *See—*
Hillman, Theodore E., 4,037,499, Cl. 83-1.000.
Larsen, Ronald Leslie, 4,038,008, Cl. 425-290.000.

Conzelmann, Gerhard: *See—*
Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.

Cook, K. Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., to United States of America, Energy Research and Development Administration. Ultrasonic probe system for the bore-side inspection of tubes and welds therein. 4,037,465, Cl. 73-67.80S.

Cooper, James E., to Mobil Oil Corporation. Oil recovery method employing acids extracted from crudes using a ion-exchange process. 4,037,656, Cl. 166-270.000.

Cooper, Richard, Jr.: *See*—
Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., 4,038,589, Cl. 318-174.000.
Coors Container Company: *See*—
Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, 4,037,752, Cl. 220-70.000.
Sirvet, Enn, 4,037,530, Cl. 101-40.000.
Coratomic Inc.: *See*—
Shipko, Frederick J., 4,037,277, Cl. 7-1.00G.
Corbin Gentry Inc.: *See*—
Hanagan, Michael W., 4,038,572, Cl. 310-46.000.
Cordon, Martin, to Colgate-Palmolive Company. Calcium meta silicate as dental polishing agent. 4,038,380, Cl. 424-49.000.
Corman, Edward M.: *See*—
Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., 4,037,374, Cl. 52-179.000.
Corning Glass Works: *See*—
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
Claypoole, Stewart A., 4,037,922, Cl. 350-96.00B.
Meyers, Wheeler W., 4,037,769, Cl. 226-190.000.
Young, Peter L., 4,038,167, Cl. 204-192.00D.
Corson, Frederick P.: *See*—
Evani, Syamalarao; and Corson, Frederick P., 4,038,265, Cl. 260-79.700.
Cosby, James Lynwood; and Morgret, Gordon Lawrence, to Koppers Company, Inc. Corrugating machine having self-adjusting web guides. 4,038,130, Cl. 156-473.000.
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, to Rhone-Poulenc S.A. 6-(1,8-Naphthyridin-2-yl)-5-piperazino carbonyloxy-7-oxo-6,7-dihydro-5H-pyrrolo-[3,4-b]pyrazines and related pyridines. 4,038,391, Cl. 424-250.000.
Coulter Electronics, Inc.: *See*—
Auer, Robert Edward; and Tucker, Howard E., 4,038,556, Cl. 250-575.000.
Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, to Lever Brothers Company. Methods and apparatus for filleting fish. 4,037,294, Cl. 17-56.000.
Cox, Alan Frederick John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Night vision apparatus. 4,037,921, Cl. 350-36.000.
Coxhill, Major, to Allis-Chalmers Corporation. Gyratory crusher having antispin device for head. 4,037,800, Cl. 241-213.000.
Coyner, Robert N.; and Skujins, Peter, to ConTech Inc. Moisture curable polyurethane systems. 4,038,239, Cl. 260-33.6UB.
Craig, Dwin R., to Columbia Research Corporation. Detection of flaws in a moving web of transparent material. 4,038,554, Cl. 250-572.000.
Cravens, Thomas E., to Dow Chemical Company, The. Low density rapid-setting polyurethanes. 4,038,238, Cl. 260-33.6UB.
Crawford, Dennis W.: *See*—
Turner, Larry G.; and Crawford, Dennis W., 4,037,624, Cl. 137-615.000.
Crawford, Joe Wade: *See*—
Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, 4,038,678, Cl. 357-81.000.
Crisan, Cornel: *See*—
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.
Cronen, Peter J., Jr. Safety apparatus for a punch press. 4,037,699, Cl. 192-134.000.
Crosby, John L.: *See*—
Crosby, Lawton H.; and Crosby, John L., 4,037,829, Cl. 267-110.000.
Crosby, Lawton H.; and Crosby, John L. Spring construction. 4,037,829, Cl. 267-110.000.
Cross, Nigel Terence: *See*—
Hewitt, Roger John Arthur; and Cross, Nigel Terence, 4,037,693, Cl. 192-3.560.
Crouch, Willie W.; and Edmonds, James T., Jr., to Phillips Petroleum Company. Production of branched arylene sulfide polymers. 4,038,261, Cl. 260-79.100.
Crouse, Dennis N.: *See*—
Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,038,459, Cl. 429-15.000.
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,038,460, Cl. 429-15.000.
Crow, William D.; and Ottersbach, Thomas V., to Emerson Electric Co. Motor lead guide and lead wire attaching means. 4,038,574, Cl. 310-71.000.
Crowell, Kenneth E., to Motorola, Inc. Miniature socket assembly. 4,037,899, Cl. 339-17.00C.
Crowther, John Cooper; and Renton, Stanley, to Albright & Wilson Limited. Method of regenerating a chromium electroplating bath. 4,038,160, Cl. 204-51.000.
Crystal, Richard G.: *See*—
Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.
Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.
Cummings, Thomas L., to Olin Corporation. Method of removing rods from metallic anodes. 4,037,304, Cl. 29-427.000.
Cunningham, Robert A., Jr.: *See*—
Cook, K. Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., 4,037,465, Cl. 73-67.80S.
Cure, Omer P., to Electro-Nite Co. Device for collecting samples of molten metal. 4,037,478, Cl. 73-425.40R.
Curley, James H.: *See*—
Anhalt, John W.; and Curley, James H., 4,037,911, Cl. 339-217.00S.
Curtiss-Wright Corporation: *See*—
Jones, Charles, 4,037,412, Cl. 60-605.000.
Curts, H. A. Julius: *See*—
Lehmann, G. W. Horst; and Curts, H. A. Julius, 4,038,454, Cl. 428-356.000.
Cutler-Hammer, Inc.: *See*—
Kintner, Paul M., 4,038,562, Cl. 307-203.000.
Oakland, Frederic; and Mallonen, Edward A., 4,038,619, Cl. 335-61.000.
D & J Products: *See*—
DeLano, Arthur D., 4,037,815, Cl. 248-285.000.
Dahl, Norman C. Process for creating overload protection against yielding in bolts. 4,037,282, Cl. 10-27.00R.
Daicel, Ltd.: *See*—
Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,038,449, Cl. 428-220.000.
Daimler-Benz Aktiengesellschaft: *See*—
Mirjanic, Milorad, 4,037,888, Cl. 308-74.000.
Dammgen, Jurgen: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Danneberg, Peter: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.
Dansk Industri Syndikat A/S: *See*—
Gunnergaard, Marius, 4,037,642, Cl. 164-18.000.
D'Aquino, Michael: *See*—
Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., 4,038,030, Cl. 23-230.00B.
Dashevsky, Yakov Tevelevich: *See*—
Kuzmich, Valery Konstantinovich; and Dashevsky, Yakov Tevelevich, 4,037,674, Cl. 177-200.000.
Data-Link Corporation: *See*—
Becking, Paul E., 4,037,803, Cl. 242-55.180.
Davidson, Hubert: *See*—
Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, 4,037,364, Cl. 51-415.000.
Davidtz, John C., to Mobil Oil Corporation. Flocculation process. 4,038,183, Cl. 210-47.000.
Davies, Donald L., to Swift & Company. Vegetable sauce composition. 4,038,424, Cl. 426-94.000.
Davis, George B., Jr. Method of packaging piecrust dough. 4,038,428, Cl. 426-394.000.
Davis, Harold R.; Brockley, Christopher A.; Parkinson, Geoffrey V.; and Price, John D. E. Manifold for ultra filtration machine. 4,038,191, Cl. 210-321.00B.
Davis, James E.: *See*—
Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., 4,038,385, Cl. 424-166.000.
Davis, Michael Ian: *See*—
Birney, Richard Eugene; and Davis, Michael Ian, 4,038,645, Cl. 364-200.000.
Bouknecht, Max Abbott; Davis, Michael Ian; and Vergari, Louis Peter, 4,038,642, Cl. 364-900.000.
Davison, Alan L., to F.P.E.C. Corporation. Food product mixer with an improved door mechanism. 4,037,827, Cl. 259-37.000.
Davitz, Daniel M., to Astro. Metal alloy composition. 4,038,074, Cl. 75-171.000.
Dawson, James Earl, to Cincinnati Milacron, Inc. Hydraulic injection molding machine with compression ram. 4,038,015, Cl. 425-451.700.
Day, Paul Edwin; and Kenney, George Churchill, to U.S. Philips Corporation; and North American Philips Corporation. Method of writing information with a modulated radiation beam onto an information storage medium and information storage medium particularly adapted to the method. 4,038,663, Cl. 346-1.000.
Dayco Corporation: *See*—
Smith, Kenneth C., 4,037,299, Cl. 29-130.000.
De Gooijer's Patent B.V.: *See*—
Oosten, Jacob van, 4,038,193, Cl. 210-400.000.
de la Lande de Calan, Yves Jean Olivier. Construction of buildings by assembling prefabricated elements. 4,037,371, Cl. 52-79.700.
Deal, Kenneth L. Fishing bait holder. 4,037,347, Cl. 43-4.000.
deBoer, Nico; and Olsen, Robert L., to J. Ray McDermott & Co. Inc. Articulated jet sled. 4,037,422, Cl. 61-72.400.
Deere & Company: *See*—
Ahlschwede, Brian Alvin; and Whisler, Edwin Lee, 4,037,487, Cl. 74-529.000.
Anderson, Sidney Elmer, 4,037,393, Cl. 56-119.000.
Hengen, Edward John; and Hutchinson, Eugene Byron, 4,037,745, Cl. 214-521.000.
Miller, Wayne Russell; Seipp, Jan Vilas; and Penfold, Garn Farley, 4,037,519, Cl. 91-1.000.
Plemitscher, Robert Antone, 4,037,334, Cl. 37-8.000.
Welck, Arnold Emil, 4,037,695, Cl. 192-13.00R.
Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.
Dehm, Henry C., to Hercules Incorporated. Composite modified dou-

ble-base propellant with filler bonding agent. 4,038,115, Cl. 149-19.800.
Deis, Daniel W., to Westinghouse Electric Corporation. Method of fabricating a mechanically stable electrical winding having cooling openings therein. 4,037,312, Cl. 29-598.000.
Deitch, James C.; and Leistiko, Lawrence F., to Magnetic Controls Company. Printed circuit jack. 4,037,913, Cl. 339-221.00M.
Del Norte Technology, Inc.: *See*—
Parker, William H., 4,038,632, Cl. 340-18.0NC.
Delafosse, Jacques: *See*—
Bergougnoux, Rene; and Delafosse, Jacques, 4,038,135, Cl. 176-68.000.
Delage, Michel: *See*—
Mendy, Francois; Delage, Michel; and Teissier, Jean, 4,038,421, Cl. 426-72.000.
DeLano, Arthur D., to D & J Products. Musical instrument support. 4,037,815, Cl. 248-285.000.
Del Castillo, Juan M. Teaching device for attachment to an organ. 4,037,511, Cl. 84-478.000.
DeLigt, John, to Westvaco Corporation. Method and apparatus for fabricating corrugated board from poly-coated paper. 4,038,122, Cl. 156-210.000.
Delligatti, Patrick. Bottom coders. 4,037,529, Cl. 101-35.000.
DeLuca, Carmine V., Jr.; Miller, Harold A.; and W[illegible]eorge R., to Mearl [illegible]poration, The. Rutile-coated [illegible] pigments and proce[illegible] for the preparation ther[illegible]6-291.000.
Demag Aktien[illegible]
Grimpe, Karl; and [illegible]249.000.
Denkinger, Marian C. [illegible]ed feminine hygiene articles of non-woven and [illegible] 4,037,601, Cl. 128-285.000.
Dennis, Richard H.: *See*—
Medlin, Eric G.; Blair, Stephen A.; and Dennis, Richard H., 4,037,856, Cl. 280-446.00B.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Certain 2,7-dihydro-4H-pyrazolo[3,4-b]pyridine-5-ketones. 4,038,281, Cl. 260-296.00H.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 4-Alkoxy or hydroxy derivatives of 2H-pyrazolo[3,4-b]pyridine-5-carboxylic acids and esters. 4,038,283, Cl. 260-295.50B.
Dependable-Fordath, Inc.: *See*—
Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., 4,037,826, Cl. 259-8.000.
DePuy, Robert P., to General Electric Company. Static trip unit for circuit protective devices. 4,038,695, Cl. 361-96.000.
de Radzitzky d'Ostrowick, Pierre M. J. G.; Hanotier, Jacques D. V.; and Vaerman, Joseph M. E. Process for the oxidation of paraffins. 4,038,322, Cl. 260-597.00R.
Dersch, James E.; and Maciey, James L., to Nautec, Inc. Ignition safety control system. 4,037,578, Cl. 123-179.0BG.
Deruelle, Jean; and Penet, Olivier, to Houilleres du Bassin de Lorraine. Coke manufacturing process. 4,038,153, Cl. 201-27.000.
DeSisto, Frank Alfred, to J. C. Penney Company. Display apparatus. 4,037,729, Cl. 211-208.000.
Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Isaac, Otto; Posselt, Klaus; and Uthemann, Horst, 4,038,386, Cl. 424-182.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, 4,038,224, Cl. 260-15.00R.
Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, 4,038,276, Cl. 260-248.00C.
Deutschman, John Edward: *See*—
Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, 4,038,039, Cl. 23-293.00R.
Devlin, Richard G., to Mead Johnson & Company. Malignancy diagnostic method. 4,038,145, Cl. 195-103.50R.
Devyatkina, Zoya Timofeevna: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
Dexter, Martin: *See*—
Knell, Martin; and Dexter, Martin, 4,038,246, Cl. 260-45.9NC.
Dey, Thomas W., to Bausch & Lomb Incorporated. Luminaire for controlling locally unidirectional light. 4,038,542, Cl. 240-92.000.
Diachuk, Wolodymyr; and Palm, Reuben N., to Century 21 Pollution Control, Inc. Kitchen hood apparatus for separating foreign matter from fluid. 4,038,056, Cl. 55-238.000.
Dialog Systems, Inc.: *See*—
Moshier, Stephen L., 4,038,503, Cl. 179-1.0SA.
Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the removal of mercury from aqueous solutions. 4,038,071, Cl. 75-108.000.
Dickinson, David W.: *See*—
Tyler, Derek E.; Dickinson, David W.; and Dore, James E., 4,038,068, Cl. 75-76.000.
Didde-Glaser, Inc.: *See*—
Gladow, Dean E., 4,037,501, Cl. 83-100.000.
Diebold, William H.; and Russo, Adolph D., to Russo Architectural Metals, Inc. Metal grating. 4,037,383, Cl. 52-664.000.
Diederen, Willi: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Diehl, Floyd William, Jr.: *See*—
Ledebur, Harry Calhoon; and Diehl, Floyd William, Jr., 4,037,444, Cl. 72-21.000.
Diehl, Richard C.: *See*—
Noren, Gerry K.; and Diehl, Richard C., 4,038,176, Cl. 208-180.000.
Diemolding Corporation: *See*—
Puderbaugh, George; and Erman, Stanley, 4,037,836, Cl. 272-99.000.
Dierks & Sohne: *See*—
Melliger, Guido W., 4,037,794, Cl. 241-46.170.
Dietrich, Paul: *See*—
Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, 4,038,429, Cl. 426-537.000.
Di Maio, Anthony E.; Bresnahan, Alfred E.; and Todisco, Joseph G., to Marson Corporation. Metal leveler tool. 4,037,448, Cl. 72-114.000.
Dimensional Development Corporation: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,037,950, Cl. 352-58.000.
Dir, Gary A.: *See*—
Haas, Werner E. L.; and Dir, Gary A., 4,037,932, Cl. 350-160.0LC.
Dison, James R.; and Thomson, George A., to United States of America, Air Force. Fluid dual filter. 4,038,189, Cl. 210-90.000.
DiVecchio, Mark Camillo: *See*—
Semmelhaack, Carl Frederick; and DiVecchio, Mark Camillo, 4,038,538, Cl. 235-154.000.
Dobrzanski, John, to Emhart Industries, Inc. Smoke detection alarm device. 4,038,649, Cl. 340-237.00S.
Dodd, John Alan: *See*—
Linning, David Lees; and Dodd, John Alan, 4,038,138, Cl. 176-81.000.
Doe, Ewart H.; and Linforth, William J., to Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H. Bar holder arrangement for bar stock material to be fed to a machine tool. 4,037,733, Cl. 214-1.500.
Dohring, Albert A.; and Dohring, Grace H. Point pressure therapy device. 4,037,590, Cl. 128-24.400.
Dohring, Grace H.: *See*—
Dohring, Albert A.; and Dohring, Grace H., 4,037,590, Cl. 128-24.400.
Dojan, Harold D., to Tennant Company. Scrubber squeegee apparatus. 4,037,289, Cl. 15-320.000.
Doland, George D. Multiple decoding system. 4,038,636, Cl. 340-146.1AV.
Donahue Corporation: *See*—
Donahue, James C., 4,037,857, Cl. 280-478.00B.
Donahue, James C., to Donahue Corporation. Elevator tongue for farm implements. 4,037,857, Cl. 280-478.00B.
Donaldson, Fraser: *See*—
Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, 4,037,294, Cl. 17-56.000.
Donze, William A.: *See*—
Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, 4,038,533, Cl. 235-151.110.
Dore, James E.: *See*—
Tyler, Derek E.; Dickinson, David W.; and Dore, James E., 4,038,068, Cl. 75-76.000.
Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, to Olin Corporation. Tool using caseless ammunition. 4,037,770, Cl. 227-9.000.
Dorman, Evans D.; and Getty, William P., to United States Steel Corporation. Movable sizing gauge. 4,037,498, Cl. 82-86.000.
Dorn, Gordon L.; and Hill, Joseph M., to J. K. and Susie L. Wadley Research Institute and Blood Bank. Sample mixing and centrifugation apparatus. 4,038,150, Cl. 195-127.000.
Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, to Siemens Aktiengesellschaft. Pressurized water-cooled reactor system. 4,038,134, Cl. 176-65.000.
Dorsey, Denis Peter; and Rodda, William E., to RCA Corporation. Circuit for elimination of surface charge integration. 4,038,581, Cl. 315-13.0ST.
Dotti, Giuseppe, to Snam Progetti S.p.A. Device for coupling a cardan half-joint with a fixed structure. 4,037,278, Cl. 9-8.00R.
Doutrelepont, Jean-Marie. Installation for conveying living fish particularly anaesthetized fish, in aqueous medium. 4,037,562, Cl. 119-5.000.
Dow Chemical Company, The: *See*—
Brown, Frederick L.; and Potter, James L., 4,038,451, Cl. 428-274.000.
Cravens, Thomas E., 4,038,238, Cl. 260-33.6UB.
Evani, Syamalarao; and Corson, Frederick P., 4,038,265, Cl. 260-79.700.
May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., 4,038,188, Cl. 210-20.000.
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,038,393, Cl. 424-250.000.
Olstowski, Franciszek, 4,038,235, Cl. 260-30.200.
Reineke, Charles E., 4,038,245, Cl. 260-45.70S.
Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, to Imperial Chemical Industries Limited. Process for aqueous dispersion of perfluoroalkyl- or perfluoroalkoxy trifluoroethylene polymers. 4,038,231, Cl. 260-29.60F.
Dowty Hydraulic Units Limited: *See*—
McLeod, Donald Patterson, 4,037,521, Cl. 91-499.000.
Dowty Mining Equipment Limited: *See*—
Hill, Nigel; and Sutton, James Anthony, 4,037,419, Cl. 61-45.00D.
Dowty Rotol Limited: *See*—
Chilman, John Alfred, 4,037,986, Cl. 416-46.000.

Doyle, William C., Jr.; and Kirkpatrick, Joel L., to Gulf Oil Corporation. 1-Dimethylcarbamyl-3-branched alkyl-1,2,4-triazol-5-yl-(N-substituted) sulfonamides and their use as insecticides. 4,038,387, Cl. 424-226.000.

Drake, Cyril Francis; and Amos, Robert Walter James, to ITT Industries, Inc. Protection of glass from aqueous attack. 4,038,430, Cl. 427-248.00E.

Dranishnikov, Afrikan Nikolaevich: *See*—
Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.

Dreyer, Heinz, to Amazonen-Werke H. Dreyer. Machine for distributing material. 4,037,545, Cl. 111-85.000.

Dreyer, Stephen F.: *See*—
Mehta, Rustam; and Dreyer, Stephen F., 4,038,646, Cl. 340-173.00R.

Dubois, Eugene. Fishing lure blade. 4,037,345, Cl. 43-42.130.

Dubois, Jean Claude, to Thomson-CSF. Method of manufacturing a liquid crystal device with plane alignment. 4,038,441, Cl. 427-109.000.

Dubois, Jean Claude: *See*—
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Duffy, Thomas E.: *See*—
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 4,037,473, Cl. 73-346.000.

Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., to NCR Corporation. Destination selection apparatus for a bus oriented computer system. 4,038,644, Cl. 364-900.000.

Dulat, Marcel: *See*—
Hennart, Claude; Dulat, Marcel; and Blanc, Rene, 4,037,353, Cl. 43-129.000.

Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, to Coors Container Company. Container with outwardly flexible bottom end wall having integral support means and method and apparatus for manufacturing thereof. 4,037,752, Cl. 220-70.000.

Dumas, Guy Henri, to Silec-Semi-Conducteurs. Method for diffusion of aluminium. 4,038,111, Cl. 148-188.000.

Dumbaugh, William H., Jr.: *See*—
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.

Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, to Allen-Bradley Company. Industrial control processor system. 4,038,533, Cl. 235-151.110.

Duncan, Farris N.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,037,775, Cl. 229-15.000.

Dunlap, Glenn H.: *See*—
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adelman, Robert L., 4,038,042, Cl. 428-625.000.
Atkins, Thomas Joseph, 4,038,312, Cl. 260-551.00P.
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.
Garth, Bruce Hollis, 4,038,043, Cl. 44-75.000.
Garth, Bruce Hollis, 4,038,044, Cl. 44-75.000.
Johnson, Alexander Lawrence, 4,038,285, Cl. 260-309.000.
Singh, Gurdial; and Von Rutte, Richard Edward, 4,038,258, Cl. 260-75.00T.

Dupuis, Jean Marcel, to Northern Telecom Limited. Apparatus for bonding wire leads. 4,037,772, Cl. 228-1.00R.

Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of acylhydroximyl halides. 4,038,316, Cl. 260-566.00A.

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, to Smith Kline & French Laboratories Limited. Certain thiazolyl and isothiazolyl compounds and compositions and methods which employ them. 4,038,408, Cl. 424-270.000.

Durley, Benton A., III. Ultrasonic piezoelectric transducer drive circuit. 4,038,570, Cl. 310-8.100.

Durville, Gerard; and Wunner, Charles Hamilton, to Singer Company, The. Closed cam track for a circular knitting machine. 4,037,434, Cl. 66-57.000.

Dusza, Robert J.; and Kantorski, Joseph W., to American Optical Corporation. Lens mold. 4,038,014, Cl. 425-388.000.

Duvall, David Scott; and Paulonis, Daniel Francis, to United Technologies Corporation. Composite interlayer for diffusion bonding. 4,038,041, Cl. 428-576.000.

Dworak, Wilhelm, to Robert Bosch G.m.b.H. Gear machine with bearing cooling and lubrication. 4,038,000, Cl. 418-102.000.

Dynamic Industries, Inc.: *See*—
Gorby, Oliver L., 4,037,681, Cl. 180-44.00R.

Dynamit Nobel Aktiengesellschaft: *See*—
Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, 4,038,254, Cl. 260-75.00N.

E. C. P., Inc.: *See*—
Williams, Tudor; and Bost, John D., 4,038,063, Cl. 65-22.000.

E M I Limited: *See*—
Lee, Cyril Arthur, 4,038,596, Cl. 324-34.00R.
LeMay, Christopher Archibald Gordon, 4,038,551, Cl. 250-445.00T.
Toull, William Herbert, 4,038,009, Cl. 425-308.000.

E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 4,038,271, Cl. 260-239.100.
Denzel, Theodor; and Hoehn, Hans, 4,038,281, Cl. 260-296.00H.
Denzel, Theodor; and Hoehn, Hans, 4,038,283, Cl. 260-295.50B.
Hauck, Frederic Peter; and Sundeen, Joseph E., 4,038,273, Cl. 260-240.00D.
Krapcho, John; and Schwartz, Joseph, 4,038,274, Cl. 260-240.00F.

Eagle Picher Industries, Inc.: *See*—
Romero, Victor R., 4,037,851, Cl. 280-79.300.

Eastman, James E., to A. E. Staley Manufacturing Company. Retort process starch derivatives. 4,038,482, Cl. 536-110.000.

Eastman Kodak Company: *See*—
Palmer, Billy W.; and Wright, Howard N., Jr., 4,038,329, Cl. 260-637.00P.

Eaton Corporation: *See*—
Johnson, Oliver Wendell, 4,037,620, Cl. 137-596.000.

Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, to Boehringer Ingelheim GmbH. Benzisothiazoline-1,1-dioxide derivatives, compositions and methods. 4,038,407, Cl. 424-270.000.

Eberly, Paul E., Jr., to Exxon Research and Engineering Company. Oil hydrodesulfurization with alumina composite catalyst utilizing aluminate and dicarboxylic acid in its preparation. 4,038,177, Cl. 208-216.000.

Eccles, Edward Stuart; and Moore, David James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britanic Majesty's government of the. Optimizing control system for aircraft. 4,038,526, Cl. 235-150.100.

Echlin Manufacturing Company, The: *See*—
Klimek, Boleslaw M.; and Mastis, Victor, 4,037,907, Cl. 339-126.00R.

Echtler, Sigmund. Earth anchor. 4,037,373, Cl. 52-127.000.

Eckles, William Edward; and Starinshak, Thomas Walter, to R. O. Hull & Company, Inc. Acid copper plating and additive composition therefor. 4,038,161, Cl. 204-52.00R.

Eco-Control, Inc.: *See*—
Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,038,459, Cl. 429-15.000.
Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,038,460, Cl. 429-15.000.

Ed. Zublin Aktiengesellschaft: *See*—
Fastenau, Werner, 4,037,979, Cl. 403-284.000.

Edmonds, James T., Jr., to Phillips Petroleum Company. Production of arylene sulfide polymers. 4,038,262, Cl. 260-79.100.

Edmonds, James T., Jr.; and Campbell, Robert W., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,038,263, Cl. 260-79.100.

Edmonds, James T., Jr.: *See*—
Campbell, Robert W.; and Edmonds, James T., Jr., 4,038,259, Cl. 260-79.100.
Crouch, Willie W.; and Edmonds, James T., Jr., 4,038,261, Cl. 260-79.100.

EDS, Inc.: *See*—
Sjogren, Christer A.; and Backman, Ralph H., 4,037,525, Cl. 93-93.00C.

Edward P. Siggia Inc.: *See*—
Siggia, Edward P., 4,037,897, Cl. 312-343.000.

Eerkes, Thijs: *See*—
Bell, Malcolm Charles Evert; Eerkes, Thijs; and Sridhar, Ramamritham, 4,038,066, Cl. 75-29.000.

Egger, Friedrich: *See*—
Manser, Josef; and Egger, Friedrich, 4,038,433, Cl. 426-615.000.

Eichler, Jay H.: *See*—
Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., 4,038,505, Cl. 200-51.100.

Eickmann, Karl. Application of an entering or deep-diving piston shoe with a central radial support member and means for securing the same in fluid handling radial piston devices. 4,037,523, Cl. 92-72.000.

Eisai Co., Ltd.: *See*—
Hamano, Sachiyuki; and Nakamura, Takaharu, 4,038,278, Cl. 260-256.40N.

Eisele, Wolfgang; Lelgemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the manufacture of impregnating melamine resins. 4,038,229, Cl. 260-29.40R.

Eisenbraun, Allan A.; and Hornbaker, Edwin D., to Ethyl Corporation. Graft copolymers of olefinic nitriles and olefinic esters on diene rubbers. 4,038,344, Cl. 260-879.000.

Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Organically modified silicic acids and silicates for delustering lacquers. 4,038,224, Cl. 260-15.00R.

Ekkelboom, Tjepke Hendrik, to U.S. Philips Corporation. Solder joint connection between lead-in conductor and electrode. 4,038,579, Cl. 313-331.000.

Elam, James O. Breathing equipment such as resuscitators. 4,037,595, Cl. 128-145.700.

Elder, James H.; and Patterson, Hubert A., to General Electric Company. Message preamble detector. 4,038,605, Cl. 328-119.000.

Electra Food Machinery, Inc.: *See*—
Jimenez, James A., 4,037,801, Cl. 241-247.000.

Electro-Nite Co.: *See*—
Cure, Omer P., 4,037,478, Cl. 73-425.40R.

Electroflood Company: *See—*
Carpenter, Neil L., 4,037,655, Cl. 166-248.000.
Elex A.G.: *See—*
Kunzle, Othello, 4,037,863, Cl. 285-320.000.
Eli Lilly and Company: *See—*
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.
Koppel, Gary A.; and Nummy, Laurence J., 4,038,275, Cl. 260-243.00C.
Eliasson, Rune; and Nedenskov, Poul, to Aktieselskabet Grindstedvaerket. Cyclopentenone derivatives. 4,038,305, Cl. 260-468.00K.
Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna. Composition for roentgenoscopy of the gastrointestinal tract containing a polysaccharide stabilizer. 4,038,379, Cl. 424-4.000.
Elion, Gertrude B.; and Strelitz, Robert A., to Burroughs Wellcome Co. Amino purine derivatives. 4,038,479, Cl. 536-24.000.
Elliott, Jack P., to J. P. Elliott Associates, Inc. Washer for bearing races. 4,037,613, Cl. 134-83.000.
Elzer, Robert R.: *See—*
Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.
Emco Ltd.: *See—*
Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.
Emerson Electric Co.: *See—*
Crow, William D.; and Ottersbach, Thomas V., 4,038,574, Cl. 310-71.000.
Kamp, Eugene L.; and Visos, Charles D., 4,038,623, Cl. 335-219.000.
Emerson, Reginald Stanley, to Leslie Hartridge Limited. Fuel injector testing apparatus. 4,037,467, Cl. 73-119.00A.
Emerson, Reginald Stanley, to Leslie Hartridge Limited. Fuel injector testing apparatus. 4,037,468, Cl. 73-119.00A.
Emery Industries, Inc.: *See—*
Rodenberg, Herbert G.; and Patton, Charles E., 4,038,297, Cl. 260-413.000.
Emhart Industries, Inc.: *See—*
Dobrzanski, John, 4,038,649, Cl. 340-237.00S.
Energiagazdalkodasi Intezet: *See—*
Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, 4,037,413, Cl. 60-655.000.
Enfield Industrial Engines Limited: *See—*
Nossiter, Clarence Frank, 4,037,558, Cl. 115-41.0HT.
Engel Industries, Inc.: *See—*
Mueller, Thomas L., 4,038,128, Cl. 156-355.000.
Engel, Stephen August; and Fuhrhop, Ronald Elmer, to Union Carbide Corporation. Method and apparatus for making an instantaneous thermochemical start. 4,038,108, Cl. 148-9.500.
Engman, Theodore Edgar: *See—*
Jespersen, Knud; and Engman, Theodore Edgar, 4,038,426, Cl. 426-266.000.
Enoguchi, Yuji: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
Envirex Inc.: *See—*
Kline, Kenneth J., 4,038,185, Cl. 210-83.000.
Saffran, Edward P., 4,038,187, Cl. 210-108.000.
Enviro-Blast International: *See—*
Rose, James J.; and Horton, Edward L., 4,037,290, Cl. 15-345.000.
Erdman, Frank H., to Tropicana Products, Inc. Method and apparatus for depalletizing. 4,037,734, Cl. 214-8.50A.
Ergenc, Mehmet Sahabettin; and Mandrin, Charles, to Sulzer Brothers Limited. Apparatus for enriching hydrogen with deuterium. 4,038,035, Cl. 23-260.000.
Erman, Stanley: *See—*
Puderbaugh, George; and Erman, Stanley, 4,037,836, Cl. 272-99.000.
Ernest Scragg & Sons Limited: *See—*
Tomlinson, Ian, 4,038,013, Cl. 425-378.00S.
Ernst Leitz Wetzlar GmbH: *See—*
Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.
Escales, Eberhard, to AGFA-Gevaert Aktiengesellschaft. Apparatus for braking webs of photographic material or the like. 4,037,768, Cl. 226-43.000.
Esteve-Subirana, Antonio, to Laboratorios del Dr. Esteve, S.A. Salts of p-dihydroxybenzene disulfonic acids for combatting hemorrhages and fragility of the capillaries. 4,038,390, Cl. 424-250.000.
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Structure for providing support for circuit plug-in units, connectors and related wiring. 4,038,696, Cl. 361-415.000.
Ethyl Corporation: *See—*
Eisenbraun, Allan A.; and Hornbaker, Edwin D., 4,038,344, Cl. 260-879.000.
Eulit Werk Staude & Co. KG: *See—*
Staude, Heinz; and Goesswald, Fritz, 4,037,442, Cl. 70-456.00R.
Evani, Syamalarao; and Corson, Frederick P., to Dow Chemical Company, The. Vinyl benzyl ethers and nonionic water soluble thickening agents prepared therefrom. 4,038,265, Cl. 260-79.700.
Evans, John James Alexander; and Holan, George, to Commonwealth Scientific and Industrial Research Organization. Acaricidal trifluoromethyl-1,2,4-triazoles. 4,038,405, Cl. 424-269.000.
Evans, Martin; and Kirkendall, James H. Fluid level detector and probe assembly. 4,038,650, Cl. 340-244.00R.
Evans, Ronald C., to McIntosh Laboratory, Inc. Multiplier circuit. 4,038,566, Cl. 307-229.000.
Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.
Extel Corporation: *See—*
Martin, Donald P.; and Ryan, Richard G., 4,037,705, Cl. 197-1.00R.
Exxon Nuclear Company, Inc.: *See—*
Pugh, Ralph A., 4,038,137, Cl. 176-78.000.
Exxon Production Research Company: *See—*
Brooks, Fred A., Jr., 4,038,093, Cl. 106-93.000.
Exxon Research and Engineering Company: *See—*
Eberly, Paul E., Jr., 4,038,177, Cl. 208-216.000.
Rae, James A., 4,038,472, Cl. 526-48.000.
F.P.E.C. Corporation: *See—*
Davison, Alan L., 4,037,827, Cl. 259-37.000.
Facit Aktiebolag: *See—*
Bergvall, Bengt Allan, 4,038,516, Cl. 219-216.000.
Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., to McDonnell Douglas Corporation. Card for use in an automated microbial detection system. 4,038,151, Cl. 195-127.000.
Fairchild Camera and Instrument Corporation: *See—*
Hoagland, Kenneth A., 4,038,690, Cl. 358-213.000.
Fan, John C. C.: *See—*
Henrich, Victor E.; and Fan, John C. C., 4,038,216, Cl. 252-514.000.
Fangmeier, Ralf, to Th.Kieserlin & Albrecht. Method of producing bright steel from rolled steel wire. 4,037,446, Cl. 72-68.000.
Fano, Joseph D.; and Hwa, Fu. Sanitary waste collector. 4,037,867, Cl. 294-19.00R.
Farnsworth, Robert S. Raft apparatus for growing plants by means of water culture. 4,037,360, Cl. 47-63.000.
Farnum, Eugene H.: *See—*
Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., 4,038,125, Cl. 156-280.000.
Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 4,038,324, Cl. 260-607.0AR.
Farrell, John J., to Farrell Patent Company. Apparatus for making a blow molded container with hollow handle and method of making. 4,038,006, Cl. 425-525.000.
Farrell Patent Company: *See—*
Farrell, John J., 4,038,006, Cl. 425-525.000.
Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Anchoring arrangement, especially for pre-stressed concrete constructions. 4,037,979, Cl. 403-284.000.
Fattore, Vittorio: *See—*
Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, 4,038,337, Cl. 260-683.200.
Feedmobile, Inc.: *See—*
Urban, Guy K., deceased, 4,037,799, Cl. 241-186.00A.
Feeney, George W, to Goodyear Tire & Rubber Company, The. Tackifier composition and rubber mixture. 4,038,346, Cl. 260-887.000.
Feezor, Michael D., to Audiometric Teleprocessing, Inc. Portable bekesy type diagnostic audiometer. 4,038,496, Cl. 179-1.00N.
Feintuch, Paul L., to Rockwell International Corporation. Adaptive recursive least mean square error filter. 4,038,536, Cl. 235-152.000.
Feldman, Mark Abramovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
Feldman, Martin; and White, Alan David, to Bell Telephone Laboratories, Incorporated. Zone plate alignment marks. 4,037,969, Cl. 356-172.000.
Feng, Bai-Cwo, to International Business Machines Corporation. Planarization of integrated circuit surfaces through selective photoresist masking. 4,038,110, Cl. 148-187.000.
Fenneteau, Michel M.: *See—*
Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., 4,038,626, Cl. 337-4.000.
Fenoglio, David J.: *See—*
Marchant, Kerford A., Jr.; and Fenoglio, David J., 4,038,266, Cl. 260-152.000.
Ferno-Washington, Inc.: *See—*
Bourgraf, Elroy E.; and Self, Kenneth R., 4,037,871, Cl. 296-20.000.
Ferns, Ricardo Segura, to Instituto de Farmacologia Espanola, S.L. (Fundacion Marques de Urquijo). Enzymatic clarification of liquids. 4,038,419, Cl. 426-12.000.
Ferrari, Rodolfo: *See—*
Bruzzese, Tiberio; and Ferrari, Rodolfo, 4,038,382, Cl. 424-117.000.
Ferrier, Vernon Dale. Wave rod system. 4,037,612, Cl. 132-31.00R.
Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, to L. Schuler GmbH. Press line with workpiece feeding device. 4,037,730, Cl. 214-1.0BB.
Fetzer, Martin, to Robert Bosch G.m.b.H. Electrical connector and connector cable. 4,037,914, Cl. 339-253.00R.
Fey, Maurice G.: *See—*
Wolf, Charles B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., 4,038,512, Cl. 219-121.00P.
Fiat-Allis Construction Machinery, Inc.: *See—*
Koch, George Paul, 4,037,677, Cl. 180-6.700.
Sandrock, Don G.; and Hoag, Peter J., 4,037,682, Cl. 180-69.00R.

Fikentscher, Rolf: *See—*
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.

Filimonov, Viktor Dmitrievich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Filip, Stanislaw F., to I.C.S. Ignition Control Systems Ltd. Oil pressure switch having improved diaphragm seal. 4,038,506, Cl. 200-83.00J.

Finck, Darrel S. Device for soilless growth of plants. 4,037,362, Cl. 47-59.000.

Finelli, Anthony F.; and Saracsan, Jeffrey W., to Goodyear Tire & Rubber Company, The. Nonstaining polyurethane from cycloaliphatic or aliphatic diisocyanates and polyhexenediol-phthalates. 4,038,256, Cl. 260-75.0NH.

Fiorentino, Donald. Lawn rakes. 4,037,397, Cl. 56-400.120.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.

Firmenich S.A.: *See—*
Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, 4,038,429, Cl. 426-537.000.

Firth, Bernard Charles. Tracheotomy tube. 4,037,605, Cl. 128-351.000.

Fisch, Richard S.; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Fix and bleach-fix bath desilvering. 4,038,080, Cl. 96-60.0BF.

Fischer, Karl. Temperature responsive devices. 4,038,613, Cl. 337-321.000.

Fisher, Baxter. Stove damper assembly. 4,037,584, Cl. 126-290.000.

Fisher, Frank H.; and Jovick, Raymond John, to Rockwell International Corporation. Sensor module bracket. 4,037,690, Cl. 188-181.00R.

Fisher, Franklin A.: *See—*
Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., 4,038,625, Cl. 336-83.000.

Fisons Limited: *See—*
Suschitzky, John Louis; and Rutherford, David, 4,038,413, Cl. 424-295.000.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.

Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., to General Electric Company. Method of making a partially impregnated capacitor. 4,037,298, Cl. 29-25.420.

Flannery, James E.: *See—*
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.

Fleagle, Joseph E., to Wagner Electric Corporation. Wheel slip control system for automotive vehicles and the like. 4,037,881, Cl. 303-106.000.

Fleming, Robert S., to Amerace Corporation. Reflector assembly. 4,037,925, Cl. 350-97.000.

Fletcher, Taylor C.; and Wilkinson, Bruce L. Sample cell for spectrophotometers. 4,037,974, Cl. 356-246.000.

Flexsteel Industries, Inc.: *See—*
Quakenbush, Howard M., 4,037,872, Cl. 297-65.000.

Flinth, Rune Nils Allan: *See—*
Nordstrom, Kjell Helge; and Flinth, Rune Nils Allan, 4,037,469, Cl. 73-141.00A.

Floyd, Roger M.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,037,775, Cl. 229-15.000.

Flumm, Paul T.; and Harris, Vernon B., to Robertshaw Controls Company. Digital timer and time indicator drums therefor. 4,037,398, Cl. 58-22.900.

FMC Corporation: *See—*
Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., 4,038,494, Cl. 178-69.100.
Pepmeier, Carl R., 4,038,018, Cl. 425-505.000.

Fogel, Arnold W.: *See—*
Conner, Donald E.; and Fogel, Arnold W., 4,038,294, Cl. 260-404.500.

Forberg, Hans-Jurgen, to Transcodan Sven Husted-Anderson, Firma. Drip chamber for infusion and transfusion apparatus formed of several parts. 4,037,597, Cl. 128-214.00C.

Ford, George Alan, to Walker-Neer Manufacturing Co., Inc. Method and apparatus for cleaning a screened well. 4,037,661, Cl. 166-311.000.

Ford Motor Company: *See—*
Ludwig, Frank A.; and Weiner, Steven A., 4,038,465, Cl. 429-104.000.
Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., 4,037,643, Cl. 164-58.000.

Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, to Ciba-Geigy Corporation. Process for the manufacture of polyaddition products containing imide groups by reaction of polymaleimides with polyhydric phenols using amine catalyst. 4,038,251, Cl. 260-47.0UA.

Forgo, Laszlo: *See—*
Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, 4,037,413, Cl. 60-655.000.

Form-Scaff (Proprietary)Limited: *See—*
Jacobs, Daniel, 4,037,382, Cl. 52-638.000.

Forsyth, Roland W. Stabilizing means for trampoline. 4,037,835, Cl. 272-65.000.

Foscolo, Peter F. Combination gaff and boat hook. 4,037,554, Cl. 114-221.00R.

Foster, Alan W.: *See—*
Besozzi, Alfio J.; and Foster, Alan W., 4,038,336, Cl. 260-680.00E.

Foster, Allen. Down-loading device. 4,037,877, Cl. 302-53.000.

Foster, Edson Perkins, to Foster Needle Company, Inc. Felting needle with barbed tip. 4,037,297, Cl. 28-115.000.

Foster Needle Company, Inc.: *See—*
Foster, Edson Perkins, 4,037,297, Cl. 28-115.000.

Foster, Newton C., to Westinghouse Electric Corporation. Epoxy-vinyl-polyester cold blended resin composition. 4,038,339, Cl. 260-835.000.

Foucras, Jacques, to Rhone-Poulenc S.A. Electrically heated flexible tube having temperature measuring probe. 4,038,519, Cl. 219-301.000.

Foulkes, Stanley Charles, to Chloride Group Limited. Manufacture of battery plates. 4,037,630, Cl. 141-1.100.

Fowler, John T., to Laitram Corporation, The. Automatic piloting system. 4,038,528, Cl. 235-150.260.

Fram Corporation: *See—*
Charles, Herbert N.; and Lie, George K., 4,037,987, Cl. 416-132.00A.

Frampton, Orville D., to National Distillers and Chemical Corporation. Olefin hydration catalyst. 4,038,211, Cl. 252-435.000.

Francel, Josef; King, James E.; and Woulbroun, John M., to Owens-Illinois, Inc. Sealing glass vehicle and composition and method for making same. 4,038,091, Cl. 106-53.000.

Francis, Peter M., to Industrial Mining Machinery Company. Rotary mill utilizing an impact reduction chamber and a vertical air flow classification chamber. 4,037,796, Cl. 241-59.000.

Franck, Kurt: *See—*
Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.

Frank W. Murphy Manufacturer, Inc.: *See—*
Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.

Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, to Bayer Aktiengesellschaft. Unsaturated polyester resins which have radicals of monohydric alcohols as terminal groups. 4,038,340, Cl. 260-861.000.

Franklin, Kurtz A.: *See—*
Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., 4,038,127, Cl. 156-353.000.

Frantzis, Paul D.: *See—*
Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,038,689, Cl. 358-191.000.

Franz, Dennis LaVerne. Paired piston engine with rotary valves. 4,037,572, Cl. 123-64.000.

Frauenglass, Elliott; and Werber, Gerhardt P., to Loctite Corporation. Highly stable anaerobic compositions. 4,038,475, Cl. 526-328.000.

Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, to Wheelabrator-Frye, Inc. Method and means for continuous surface treatment. 4,037,364, Cl. 51-415.000.

Freeman, Arthur G. Tallying method and means. 4,038,525, Cl. 235-92.0CN.

Freeman, Gary M., to Gilford Instrument Laboratories, Inc. Photometric measuring system. 4,038,555, Cl. 250-573.000.

Freer, Edgar P. Positioning and indexing apparatus. 4,037,493, Cl. 74-820.000.

Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, to Vockenhuber, Karl; and Hauser, Raimund. Film-transport control for sound-film camera. 4,037,947, Cl. 352-27.000.

Friebel, Virgil R.: *See—*
Loran, Thomas J.; Friebel, Virgil R.; and Pardee, Robert P., 4,038,453, Cl. 428-325.000.

Fried, Krupp Gesellschaft mit beschrankter Haftung: *See—*
Althoff, Heinz, 4,037,735, Cl. 214-10.000.

Friedman, Moshe, to United States of America, Navy. Automodulated realtivistic electron beam microwave source. 4,038,602, Cl. 325-125.000.

Frierdich, Richard D.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.

Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., to United States of America. Energy Research and Development Administration. Method for mounting laser fusion targets for irradiation. 4,038,125, Cl. 156-280.000.

Friese, Lucia F.: *See—*
Trifiletti, Thomas, 4,037,581, Cl. 126-39.00M.

Fritz, Manfred: *See—*
Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, 4,038,254, Cl. 260-75.00N.

Frye, George J. Microphone coupler. 4,038,500, Cl. 179-175.10A.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Tube forming. 4,037,454, Cl. 72-264.000.

Fuchs, Hans: *See—*
Rix, Albert; Fuchs, Hans; and Onuscheit, Jens, 4,037,698, Cl. 192-105.0CE.

Fuchs, Werner Karl Heinz. Anti-locking brake system. 4,037,883, Cl. 303-116.000.

Fuhrhop, Ronald Elmer: *See—*
Engel, Stephen August; and Fuhrhop, Ronald Elmer, 4,038,108, Cl. 148-9.500.

Fuji Electric Company Ltd.: *See—*
Namba, Masaharu; Nagasawa, Ikuo; and Mukae, Kazuo, 4,038,217, Cl. 252-521.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Mizuno, Yukio; and Hiramoto, Midori, 4,037,407, Cl. 60-277.000.
Ozawa, Masahiro, 4,037,408, Cl. 60-282.000.

Fuji Photo Film Co., Ltd.: *See—*
Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
Utumi, Tadae, 4,038,442, Cl. 427-128.000.
Yoshida, Takashi; and Yamamoto, Nobuo, 4,038,082, Cl. 96-77.000.

Fujii, Akira: *See—*
Terada, Yoshimi; and Fujii, Akira, 4,037,869, Cl. 294-104.000.

Fujikura, Yoshiaki: *See—*
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY.

Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, to Kao Soap Co., Ltd. Process for preparation of powdery detergent compositions. 4,038,218, Cl. 252-542.000.

Fujita, Kenichi: *See—*
Uchida, Kenji; and Fujita, Kenichi, 4,037,992, Cl. 417-102.000.

Fujiwara, Takao: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.

Fukaya, Kuniaki: *See—*
Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, 4,037,933, Cl. 350-161.00W.

Fukuda, Hideo: *See—*
Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, 4,038,452, Cl. 428-224.000.

Fukuda, Sigeo: *See—*
Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, 4,038,287, Cl. 260-309.700.

Fukuda, Takashi: *See—*
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, to Nippon Kokan Kabushiki Kaisha. Method for removing hydrogen sulfide. 4,038,366, Cl. 423-234.000.

Fukuoka, Itsuo: *See—*
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.

Fuller, Henry Edward, Jr., to American Optical Corporation. Portable medical data recorder. 4,038,666, Cl. 346-136.000.

Furuno Electric Company: *See—*
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.

Furuno, Kouji: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.

Fyfe, Donald R. Waste disposal systems. 4,037,795, Cl. 241-58.000.

G. D. Searle & Co., Limited: *See—*
Birch, John R., 4,038,139, Cl. 195-1.800.

Gainer, John L., to University of Virginia, The. Method of increasing fermentation yields. 4,038,144, Cl. 195-100.000.

Gainsborough Hardware Industries, Pty., Ltd.: *See—*
Hook, John Laurence, 4,037,865, Cl. 292-357.000.

Gallatig, George: *See—*
Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., 4,038,127, Cl. 156-353.000.

Gallet, Bernard; and Venot, Robert, to Commissariat a l'Energie Atomique. Support structure for the lateral neutron shield system of a fast reactor core. 4,038,136, Cl. 176-87.000.

Gallo, Michael R. Auto ignition system. 4,037,577, Cl. 123-148.00E.

Gallois, Jacques, to Societe d'Etudes de Machines Thermiques. Electric power generating device fed with energy recovered from the exhaust gases of an internal combustion engine. 4,038,558, Cl. 290-52.000.

Gallone, Cesare. Strip of light-signal unit shells. 4,037,908, Cl. 339-147.00R.

Gamble, James R.; and Chapman, James W., to Westinghouse Electric Corporation. Fluid casting composition containing low expansion glass filler. 4,038,491, Cl. 174-153.00R.

Ganellin, Charon Robin: *See—*
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.

Ganssle, Eugene R.: *See—*
Webster, Donald R.; and Ganssle, Eugene R., 4,037,970, Cl. 356-188.000.

Ganter, Wolfgang; and Scholz, Gunter, to Gebruder Junghans GmbH, Firma. Apparatus for adjusting a date ring of a watch. 4,037,401, Cl. 58-58.000.

Gantman, Sarra Abramovna: *See—*
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.

Garcia Corporation: *See—*
Bourque, Rene, 4,037,758, Cl. 222-134.000.

Garcia Lorenzen, Felix Hector. Musical chord and note calculator. 4,037,518, Cl. 84-474.000.

Gardner, Kenneth William: *See—*
Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, 4,038,559, Cl. 307-64.000.

Garlock Inc.: *See—*
Pendleton, Darrell D., 4,038,359, Cl. 264-263.000.

Garner, Lloyd L., to Smith International, Inc. Drilling bit bearing structure. 4,037,300, Cl. 29-148.40R.

Garrison, Harold Keith: *See—*
White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, 4,037,528, Cl. 100-191.000.

Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. Gasoline additive compositions comprising a combination of monoamine and polyamine Mannich bases. 4,038,043, Cl. 44-75.000.

Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. Gasoline additive compositions comprising a combination of diamine and polyamine Mannich Bases. 4,038,044, Cl. 44-75.000.

Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., to Motorola, Inc. Subminiature connector arrangement. 4,038,505, Cl. 200-51.100.

Gates, Wendall C., to Advanced Instrumentation Inc. Explosion-proof flow sampling apparatus. 4,037,472, Cl. 73-421.00B.

Gattermann, Bernd: *See—*
Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, 4,037,759, Cl. 222-142.000.

Gattus, Jean: *See—*
Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.

Gautschi, Fritz: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.

Gebruder Junghans GmbH, Firma: *See—*
Ganter, Wolfgang; and Scholz, Gunter, 4,037,401, Cl. 58-58.000.

Gebrueder Buehler AG: *See—*
Manser, Josef; and Egger, Friedrich, 4,038,433, Cl. 426-615.000.

Geiger, David H.: *See—*
Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.

Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of finely divided solid cyanuric chloride. 4,038,276, Cl. 260-248.00C.

Geiss, Vernon L.: *See—*
Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.

General Dynamics Corporation: *See—*
Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.

General Electric Company: *See—*
DePuy, Robert P., 4,038,695, Cl. 361-96.000.
Elder, James H.; and Patterson, Hubert A., 4,038,605, Cl. 328-119.000.
Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., 4,037,298, Cl. 29-25.420.
Graham, Alfred Rapp, 4,037,995, Cl. 417-349.000.
Harris, David J., 4,037,990, Cl. 416-220.00R.
Mapelsden, George C., 4,038,508, Cl. 200-329.000.
Stoll, Donald H., 4,037,316, Cl. 29-622.000.
Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., 4,038,625, Cl. 336-83.000.
White, James A., 4,038,510, Cl. 219-10.55E.
Wilson, Arthur C., 4,037,490, Cl. 74-553.000.

General Foods Corporation: *See—*
Martin, Thom O., 4,038,427, Cl. 426-285.000.

General Mills Chemicals, Inc.: *See—*
Karl, Curtis Lee, 4,038,206, Cl. 252-316.000.

General Mills, Inc.: *See—*
Kost, Walter Robert, 4,037,474, Cl. 73-421.00R.

General Motors Corporation: *See—*
Taylor, David W., 4,037,882, Cl. 303-107.000.

General Signal Corporation: *See—*
Hillyer, Michael J.; and Madison, Victor J., 4,038,573, Cl. 310-71.000.
Kleimeyer, Vernon T.; and Schinner, Thomas J., 4,038,522, Cl. 235-61.70B.

Geno, Wayne H.: *See—*
Burkley, Harold W.; and Geno, Wayne H., 4,037,318, Cl. 29-623.000.

Georg, Werner; Heberling, Walter; and Langenberg, Werner, to Gewerkschaft Eisenhutte Westfalia. Tightening arrangement for longwall mining machine cable and conveyor. 4,037,876, Cl. 299-43.000.

George Kent Limited: *See—*
Record, Robert George Hamilton, 4,037,773, Cl. 228-122.000.

George, Philip F. Smoking system. 4,037,610, Cl. 131-184.00A.

Georgi, Heinz W., to Ivac Corporation. Method and apparatus for fluid flow control. 4,037,598, Cl. 128-214.00E.

Gerard, Bernard: *See—*
Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.

Germain, Roger Louis Elysee, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Universal-joint assemblies and self-aligning thrust bearings, especially for the shafts of rotating machines. 4,037,887, Cl. 308-72.000.

Gerry, Martin E. Still image slide combination with sequentially activated audio channels per slide. 4,038,691, Cl. 360-2.000.

Gerth, Howard L., to United States of America, Energy Research and

Development Administration. Combination spindle-drive system for high precision machining. 4,037,496, Cl. 82-28.00R.
Getty, William P.: *See—*
Dorman, Evans D.; and Getty, William P., 4,037,498, Cl. 82-86.000.
Geweke, Werner: *See—*
Boden, Karl; and Geweke, Werner, 4,037,886, Cl. 308-10.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.
Giannotti, Albert J. Beverage cooler assembly. 4,037,428, Cl. 62-371.000.
Gibson, John C., to Gibson Motor and Machine Service, Inc. Fire fighting-foam producing module. 4,037,664, Cl. 169-15.000.
Gibson Motor and Machine Service, Inc.: *See—*
Gibson, John C., 4,037,664, Cl. 169-15.000.
Gibson, Roy Morris; and Sprokel, Gerard John, to International Business Machines Corporation. Method for producing selected alignment in liquid crystal. 4,038,439, Cl. 427-38.000.
Gissler, Horst; and Luckerath, Klaus. Track for a combined monorail and overhead monorail. 4,037,541, Cl. 104-109.000.
Gilchrist, Edgar S.: *See—*
Karsh, Herbert; and Gilchrist, Edgar S., 4,037,767, Cl. 226-7.000.
Gildenberg, Philip L. Method of measuring blood flow by radiation. 4,037,585, Cl. 128-2.00A.
Gildersleeve, Oliver DeP., Jr.; and Hunger, George A., Jr. Particulate energy absorber. 4,038,557, Cl. 290-1.00R.
Gilford Instrument Laboratories, Inc.: *See—*
Freeman, Gary M., 4,038,555, Cl. 250-573.000.
Gilvar, Martin, to Morgan Construction Company. Apparatus for supporting bearing chocks in a rolling mill. 4,037,450, Cl. 72-237.000.
Ginex, Michael F.; and Thomas, Donald E. Fret refinishing apparatus and method. 4,037,510, Cl. 84-453.000.
Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,038,290, Cl. 260-348.50L.
Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,038,291, Cl. 260-348.50L.
Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,038,292, Cl. 260-348.50L.
GKN Transmissions Limited: *See—*
Hewitt, Roger John Arthur; and Cross, Nigel Terence, 4,037,693, Cl. 192-3.560.
Gladow, Dean E., to Didde-Glaser, Inc. Through-the-cylinder slug out device. 4,037,501, Cl. 83-100.000.
Glasrock Products, Inc.: *See—*
McDaniel, John E.; and Morris, Harold B., 4,037,976, Cl. 401-198.000.
Glaxo Laboratories Limited: *See—*
Walker, Derek; and Chapman, Philip Howard, 4,038,469, Cl. 526-19.000.
Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Ion exchangeable glass having low thermal expansion. 4,038,090, Cl. 106-53.000.
Gloeckler, Arthur John: *See—*
Widmer, John Robert; and Gloeckler, Arthur John, 4,038,523, Cl. 235-61.90R.
Gloxhuber, Christian: *See—*
Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.
Godwin, Gurney L.: *See—*
Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., 4,038,589, Cl. 318-174.000.
Goesswald, Fritz: *See—*
Staude, Heinz; and Goesswald, Fritz, 4,037,442, Cl. 70-456.00R.
Golay, Marcel J. E., to Perkin-Elmer Corporation, The. Method and apparatus for introducing liquid samples into a gas chromatographic column. 4,038,053, Cl. 55-160.000.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friendich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy game device and method. 4,037,840, Cl. 273-85.00A.
Golobay, Gary L.; and Schrag, Robert L., to NCR Corporation. Actuator for a wire matrix printer and method of making. 4,037,704, Cl. 197-1.00R.
Goloff, Alexander, to Caterpillar Tractor Co. Rotary engine cooling. 4,037,998, Cl. 418-83.000.
Goncharova, Nina Efimovna: *See—*
Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.
Gongwer, Calvin A., to Innerspace Corporation. Fluid control valve. 4,037,615, Cl. 137-1.000.
Gonsalves, Michael; and Sarmiento, Constante C. Blower for edger. 4,037,667, Cl. 172-14.000.
Goodyear Tire & Rubber Company, The: *See—*
Castner, Kenneth F., 4,038,471, Cl. 526-142.000.
Feeney, George W, 4,038,346, Cl. 260-887.000.
Finelli, Anthony F.; and Saracsan, Jeffrey W., 4,038,256, Cl. 260-75.0NH.
Hoback, Ronald D., 4,037,485, Cl. 74-229.000.
White, John R.; Krishnan, Ram M.; and Wolfe, James D., 4,038,088, Cl. 106-38.240.
Goralski, Christian T.: *See—*
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,038,393, Cl. 424-250.000.
Gorby, Oliver L., to Dynamic Industries, Inc. Towable front end loader. 4,037,681, Cl. 180-44.00R.
Gordon, Michael, to Koret, Inc. Hinged handbag handle apparatus. 4,037,633, Cl. 150-33.000.
Gorokhov, Veniamin Ivanovich: *See—*
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
Gorter, Frederik Willem; and Wijn, Henricus Petrus Johannes, to U.S. Philips Corporation. Magnetoresistance detection device having noise suppression. 4,038,597, Cl. 324-46.000.
Goser, Karl, to Siemens Aktiengesellschaft. Pair of bipolar transistors having base zones which are electrically conductively connected to one another, and a process for producing the pair of transistors. 4,038,676, Cl. 357-34.000.
Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, to Mitsubishi Jukogyo Kabushiki Kaisha. Impregnated fibrous catalyst for treating exhaust gas of an internal combustion engine and process for making same. 4,038,214, Cl. 252-458.000.
Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, to Texas Instruments Incorporated. Power transistor and thyristor adapter. 4,038,678, Cl. 357-81.000.
Gottfried, Rudolf: *See—*
Reichel, Sigrid; and Gottfried, Rudolf, 4,038,302, Cl. 260-448.20E.
Gottlieb, Wilmers: *See—*
Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
Gould Inc.: *See—*
Hou, Shou L.; and Carnahan, Robert D., 4,038,667, Cl. 346-140.00R.
Graber, Homer R.: *See—*
Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., 4,037,410, Cl. 60-445.000.
Graf, Peter E.; and Schmidt, Robert J., to Chevron Research Company. Bituminous emulsion-mineral aggregate compositions containing silanes as adhesion promoters. 4,038,096, Cl. 106-277.000.
Graff, Roderich W. Adsorption apparatus. 4,038,054, Cl. 55-179.000.
Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (damper). 4,037,995, Cl. 417-349.000.
Grantham, Geoffrey John: *See—*
Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, 4,037,294, Cl. 17-56.000.
Gravely, Lawrence E.: *See—*
Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.
Gray, Roger M.: *See—*
Webb, John G., Jr.; and Gray, Roger M., 4,038,656, Cl. 343-5.0SA.
Green, David William, to British Syphon Industries Limited. Preparation of beverages. 4,037,757, Cl. 222-129.200.
Greene, Frank E., to United States of America, Army. Telescoping retractor. 4,037,821, Cl. 254-93.00R.
Gregorio, Henry D.: *See—*
Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.
Gregory, Clive Allen: *See—*
Kemlo, Kenneth Garry; and Gregory, Clive Allen, 4,037,761, Cl. 222-590.000.
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, to BASF Aktiengesellschaft. Alkylene oxide derivatives based on polytetrahydrofuran copolymers. 4,038,296, Cl. 260-410.600.
Greig, Douglas J. Variable on-and off-time relaxation oscillator. 4,038,611, Cl. 331-108.00D.
Greyson, Jerome: *See—*
Johnston, Katharine Gentry; and Greyson, Jerome, 4,038,485, Cl. 23-230.00B.
Grice-Hutchinson, Edward Henry: *See—*
Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, 4,038,234, Cl. 260-29.60F.
Grichnik, James A. Electroencephalograph display. 4,037,586, Cl. 128-2.10B.
Griffith, George L., to IMC Chemical Group, Inc. Enclosure for explosive material. 4,037,536, Cl. 102-20.000.
Grimpe, Karl; and Reth, Erich, to Demag Aktiengesellschaft. Group gearing arrangement in a continuous rolling mill. 4,037,452, Cl. 72-249.000.
Griner, Arthur J.; and Koppa, Daniel Anthony, to Nabisco, Inc. Apparatus for making hollow molded products. 4,038,007, Cl. 425-259.000.
Griner, Arthur J.; and Koppa, Daniel Anthony, to Nabisco, Inc. Apparatus for making hollow molded products. 4,038,016, Cl. 425-451.900.
Grisar, J. Martin; and Claxton, George P., to Richardson-Merrell Inc. N-(phenylether-substituted benzyl)alkanediamines. 4,038,412, Cl. 424-280.000.
Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Apparatus for the spectral analysis of materials. 4,037,962, Cl. 356-86.000.
Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Spark-discharge apparatus with ground detection safety circuit. 4,037,963, Cl. 356-86.000.
Griswold, Augustus W.; and Haritonoff, Boris W. Microfiche deleter method. 4,038,124, Cl. 156-248.000.
Groebke, Wolfgang, to Sandoz Ltd. 2'-Alkoxyacylamino-4'-

alkylamino-4-nitro-1,1 -azobenzene disperse dyes. 4,038,269, Cl. 260-207.000.

Gronemann, Hans-Joachim: *See—*
Wachter, Herbert; and Gronemann, Hans-Joachim, 4,038,595, Cl. 323-45.000.

Grosse-Heitmeyer, Johann: *See—*
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.

Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, to Amazonen-Werke H. Dreyer. Seed planting machine. 4,037,759, Cl. 222-142.000.

Grossman, Harold, to Montclair Research Corporation. Cigarette and filter for tobacco smoke. 4,037,607, Cl. 131-10.00R.

Grossman, Leonard N.: *See—*
Noble, Lowell A.; Grossman, Leonard N.; and Marlowe, Mickey O., 4,038,117, Cl. 156-2.000.

Grove, Clinton E. Apparatus for adjusting camber. 4,037,680, Cl. 180-43.00R.

Grubb, Fred H.: *See—*
Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.

Grummon, Bryan R.: *See—*
Chiodi, Wayne R.; and Grummon, Bryan R., 4,038,621, Cl. 335-213.000.

Grunberg, Emanuel: *See—*
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.

Grunewald, Ernst, to Hobart Corporation. Dishwasher filter flushing system. 4,038,103, Cl. 134-10.000.

Gruzdev, Avenir Mikhailovich: *See—*
Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.

Gryctko, Carl E., to I-T-E Imperial Corporation. Circuit breaker having thermal and solid state trip means. 4,038,618, Cl. 335-23.000.

Gschwendtner, Horst: *See—*
Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.

GSF Corporation: *See—*
Ver Hage, Richard P., 4,037,746, Cl. 215-31.000.

GTE Sylvania Incorporated: *See—*
Audesse, Emery G.; and Armstrong, Donald E., 4,038,020, Cl. 431-93.000.
Jayne, Max Leroy, 4,037,906, Cl. 339-107.000.
Minnier, Henry B.; and Layman, H. David, 4,038,205, Cl. 252-301.60S.

Guay, Wilbur J., to Newmont Explorations Limited. Increasing the recoverability of gold from carbonaceous gold-bearing ores. 4,038,362, Cl. 423-40.000.

Guerra, John Michael. Cryogenic cameras. 4,038,669, Cl. 354-76.000.

Gulf Oil Corporation: *See—*
Doyle, William C., Jr.; and Kirkpatrick, Joel L., 4,038,387, Cl. 424-226.000.

Gulyaeva, Galina Petrovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Gun, Dmitry Rudolfovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Method in the operation of an apparatus for producing castings. 4,037,642, Cl. 164-18.000.

Gunther Papenmeier KG Maschinen-und Apparatebau: *See—*
Bremer, Horst, 4,038,010, Cl. 425-314.000.

Gurevich, Isaak Yakovlevich: *See—*
Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.

Gustafsson, Hans Eric Karl, to Hiab-Foco Aktiebolag. Programme controlled hydraulic loading crane. 4,037,742, Cl. 214-138.00R.

Gutteridge, Ronald J.; and Stickney, George A., to Motorola, Inc. Integrated circuit and method. 4,037,306, Cl. 29-577.000.

Guyer, Robert Charles, to RCA Corporation. Optical adjustment device. 4,037,942, Cl. 350-285.000.

Guyette, Edward L., to Beckman Instruments, Inc. Snap-in electrical terminals. 4,037,898, Cl. 339-17.00C.

H. B. Contracting Ltd.: *See—*
Berg, Harry, 4,037,425, Cl. 61-112.000.

H. H. Robertson Company: *See—*
Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., 4,037,377, Cl. 52-309.900.

Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Electrooptic-photoconductor sandwich using actinic readout light. 4,037,932, Cl. 350-160.0LC.

Haberlin, Paul. Ski pole handle or the like. 4,037,850, Cl. 280-11.37H.

Haberman, Charles E., to Oil Shale Corporation (Tosco), The. Char composition and a method for making a char composition. 4,038,100, Cl. 106-307.000.

Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy AG. Mono- and dialcohols of five or six membered N-heterocyclic compounds, containing two NH groups per molecule. 4,038,277, Cl. 260-256.40C.

Habermeier, Jurgen, to Ciba-Geigy Corporation. Linear polyesters based on N,N-heterocyclic dicarboxylic acids. 4,038,255, Cl. 260-75.00N.

Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, to Konishiroku Photo Industry Co., Ltd. Development method. 4,038,081, Cl. 96-66.300.

Hackman, Emory E., to United States of America, Navy. Spiral channel blast-fragment warhead. 4,037,539, Cl. 102-67.000.

Haentjens, Walter D. Pump coupling. 4,037,980, Cl. 403-336.000.

Hagenbohmer, Bodo; and Schaefer, Philipp, to Michelin Recherche et Technique. Safety pneumatic tire. 4,037,636, Cl. 152-347.000.

Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H.: *See—*
Doe, Ewart H.; and Linforth, William J., 4,037,733, Cl. 214-1.500.

Hajdu, Paul A.: *See—*
Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., 4,037,940, Cl. 350-242.000.

Hakata, Masayuki, to Casio Computer Co., Ltd. Multi-level voltage selection circuit. 4,038,564, Cl. 307-205.000.

Hale, David F.: *See—*
Morton, Richard F.; and Hale, David F., 4,038,518, Cl. 219-218.000.

Halker, Bruce B.: *See—*
Rhees, Raymond C.; and Halker, Bruce B., 4,038,170, Cl. 204-290.00R.

Hall, Charles M.; and Johnson, Herbert G., to Upjohn Company, The. Compounds, compositions and methods of use. 4,038,398, Cl. 424-263.000.

Hall, Floyd Vanmeda, to Liggett Group Inc. Apparatus for combining a tube with a cigarette filter. 4,037,524, Cl. 93-77.0FT.

Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, to U.S. Philips Corporation. Photocathode support of corundum with layer of barium boroaluminate or calcium boroaluminate glass. 4,038,576, Cl. 313-101.000.

Hamano, Sachiyuki; and Nakamura, Takaharu, to Eisai Co., Ltd. 4-Aminopyrimidium derivatives and preparation thereof. 4,038,278, Cl. 260-256.40N.

Hamer, Edward G.; and Phillips, Calvert F., Jr., to United States of America, Air Force. Frequency agility radar. 4,038,659, Cl. 343-17.10R.

Hamill, Robert L.: *See—*
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.

Hamilton, Stephen P.: *See—*
Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.

Hanagan, Michael W., to Corbin Gentry Inc. Magnetic clutch device. 4,038,572, Cl. 310-46.000.

Handlos, Arthur E.: *See—*
Knott, Robert F.; and Handlos, Arthur E., 4,038,156, Cl. 203-45.000.

Handy Button Machine Company: *See—*
Loui, Phillip J.; and Schmidt, James A., Jr., 4,037,813, Cl. 248-250.000.

Hannan, John I., to Phillips Stamping Co., Inc. Load supporting bearing plate. 4,037,418, Cl. 61-45.00B.

Hanotier, Jacques D. V.: *See—*
de Radzitzky d'Ostrowick, Pierre M. J. G.; Hanotier, Jacques D. V.; and Vaerman, Joseph M. E., 4,038,322, Cl. 260-597.00R.

Hanson, Richard A., to Systron Donner Corporation. Low stress optical mounting structure and method. 4,037,944, Cl. 350-310.000.

Hanssen, Albert J.: *See—*
Soderberg, Roy E.; and Hanssen, Albert J., 4,037,818, Cl. 251-121.000.

Hansson, Jan Erik Enefrid, to Sund-Akesson Aktiebolag. Injection molding machine. 4,038,003, Cl. 425-137.000.

Hanstein, Friedrich; and Moench, Theodor Peter, to Rohm GmbH. Method for contouring the surface of thermoplastic synthetic resins. 4,038,360, Cl. 264-293.000.

Hanyu, Susumu; and Amano, Takashi, to Janome Sewing Machine Co. Case for portable sewing machines. 4,037,549, Cl. 112-258.000.

Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, to Sumitomo Metal Industries, Ltd.; and Satosen Company Limited. Molds for continuously casting steel. 4,037,646, Cl. 164-273.00R.

Harand, Elmar: *See—*
Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, 4,038,134, Cl. 176-65.000.

Hareng, Michel: *See—*
Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl. 350-160.0LC.

Hargreaves, Walter A., to Optovac, Inc. Polycrystalline bodies and means for producing them. 4,038,201, Cl. 252-300.000.

Haritonoff, Boris W.: *See—*
Griswold, Augustus W.; and Haritonoff, Boris W., 4,038,124, Cl. 156-248.000.

Harkness, Joseph R., to Briggs & Stratton Corporation. Brake safety system for a power driven rotary mower. 4,037,389, Cl. 56-11.300.

Harman, Julius, to Alfred Herbert Limited. Automatic machine tool and method of operation. 4,038,591, Cl. 318-578.000.

Harrington Manufacturing Company: *See*—
Mitchell, John D.; and Jordan, Bertram L., 4,037,391, Cl. 56-27.500.

Harris, David J., to General Electric Company. Composite turbomachinery rotor. 4,037,990, Cl. 416-220.00R.

Harris, David L.: *See*—
Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., 4,037,826, Cl. 259-8.000.

Harris, Donald Wayne: *See*—
Antrim, Richard Lee; and Harris, Donald Wayne, 4,038,481, Cl. 536-56.000.

Harris, Garrett H.; and Harris, Louis M. Boat steering mechanism for outboard motor. 4,037,556, Cl. 115-18.00R.

Harris, Louis M.: *See*—
Harris, Garrett H.; and Harris, Louis M., 4,037,556, Cl. 115-18.00R.

Harris, Vernon B.: *See*—
Flumm, Paul T.; and Harris, Vernon B., 4,037,398, Cl. 58-22.900.

Hart, Mark M. Safety device and method. 4,037,516, Cl. 85-62.000.

Hartel, Gunter. Apparatus for the predetermined addition of secondary air for the optimum combustion of exhaust gases of internal combustion engines. 4,037,406, Cl. 60-276.000.

Hartig, Juergen: *See*—
Weitz, Hans-Martin; and Hartig, Juergen, 4,038,307, Cl. 260-497.00A.

Hartka, Dale R. Heating and refrigeration system. 4,037,649, Cl. 165-16.000.

Hartmann, Eduard, to Bucher-Guyer AG Maschinenfabrik. Measurement apparatus for determining the degree of filling of a casting mold. 4,038,004, Cl. 425-150.000.

Harva, Olavi: *See*—
Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, 4,038,223, Cl. 260-9.000.

Harwood, Leopold Albert, to RCA Corporation. Chroma-burst separator and amplifier. 4,038,681, Cl. 358-20.000.

Hasegawa, Yoshihisa: *See*—
Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.

Haseler, Helmut: *See*—
Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, 4,038,079, Cl. 96-60.0BF.

Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Piperidone intermediates useful in the preparation of aryldecahydropyrrolo [3,4-f]quinolines. 4,038,273, Cl. 260-240.00D.

Haug, Theobald: *See*—
Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.

Hauni-Werke Korber & Co., KG: *See*—
Wahle, Gunter, 4,037,608, Cl. 131-21.00B.
Wochnowski, Waldemar, 4,037,712, Cl. 198-524.000.

Hauser, Raimund: *See*—
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.

Hawthorne, Janet R. Adaptable diaper. 4,037,602, Cl. 128-287.000.

Hawthorne, M. Marion: *See*—
Newman, James L.; and Hawthorne, M. Marion, 4,038,560, Cl. 307-106.000.

Hayakawa, Hayashi: *See*—
Nishino, Atsushi; Hayakawa, Hayashi; and Kumano, Hiroshi, 4,038,159, Cl. 204-38.00A.

Hayashi, Toshikazu: *See*—
Nakano, Tsunetomo; Nishio, Kazuaki; Hayashi, Toshikazu; and Andou, Hiroshi, 4,038,084, Cl. 96-115.00P.

Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., to I-T-E Imperial Corporation. High voltage contactor. 4,038,626, Cl. 337-4.000.

Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Food bar. 4,038,423, Cl. 426-72.000.

Haywood, George L., to Norton Company. Method of making a flexible resilient abrasive. 4,038,047, Cl. 51-295.000.

Heberling, Walter: *See*—
Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.

Heckele, Helmut, to Richard Wolf GmbH. Laryngoscopes. 4,037,588, Cl. 128-11.000.

Hedberg, Frederick L.: *See*—
Arnold, Fred E.; and Hedberg, Frederick L., 4,038,320, Cl. 260-578.000.

Hedstrom, Norman; Wright, David; and O'Toole, Jerome, to Wright Line Inc. Document storage system. 4,037,895, Cl. 312-233.000.

Heider, Joachim: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Heil-Quaker Corporation: *See*—
Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., 4,038,061, Cl. 62-126.000.

Heimberger, Werner: *See*—
Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, 4,038,276, Cl. 260-248.00C.

Heinemann Electric Company: *See*—
Tarchalski, Edward; and Wilkinson, John C., 4,038,584, Cl. 361-104.000.

Heisler, Raymond A. Anti-jam converging apparatus for bailed containers from plural conveyors. 4,037,711, Cl. 198-452.000.

Heitmann, Knut: *See*—
Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.

Hellenkamp, Johann F., to Litton Industrial Products, Inc. Piezoelectric dental cleaning device. 4,038,571, Cl. 310-8.200.

Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, to Energiagazdalkodasi Intezet. Power plant with a closed cycle comprising a gas turbine and a work gas cooling heat exchanger. 4,037,413, Cl. 60-655.000.

Heller, Zindel H.: *See*—
Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., 4,038,030, Cl. 23-230.00B.

Hellermann Cassettes Limited: *See*—
Leshik, Edward Alexander, 4,038,694, Cl. 360-105.000.

Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erick, to Mo Och Domsjo. Asphalt compositions having improved adhesion to aggregate. 4,038,102, Cl. 106-316.000.

Helsen, Walter A. M.: *See*—
Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.

Hemphill, Charles Wayne, to ADCO Buckets, Inc. Excavating bucket and teeth for a backhoe. 4,037,337, Cl. 37-141.00R.

Hemsley, Thomas Bentham, deceased: *See*—
Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.

Hemsley, Vera, executrix: *See*—
Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.

Hencye, Ronald E.: *See*—
Lanz, Donald D.; and Hencye, Ronald E., 4,037,403, Cl. 59-8.000.

Henderson, John E. Support table for pipe bender. 4,037,457, Cl. 72-389.000.

Henderson, Leslie; and Hemsley, Thomas Bentham, deceased (by Hemsley, Vera, executrix), to Clarke Chapman Limited. Orbital welding apparatus. 4,038,509, Cl. 219-60.00A.

Hengen, Edward John; and Hutchinson, Eugene Byron, to Deere & Company. Combine grain tank unloading mechanism. 4,037,745, Cl. 214-521.000.

Henkel & Cie G.m.b.H: *See*—
Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.

Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., to Owatonna Manufacturing Company, Inc. Tractor pulled crop harvester. 4,037,395, Cl. 56-218.000.

Hennart, Claude; and Blanc, Rene, to Airwick Industries, Inc. Electrical device which emits insecticidal vapors. 4,037,352, Cl. 43-129.000.

Hennart, Claude; Dulat, Marcel; and Blanc, Rene, to Airwick Industries, Inc. Device for emitting vapors of active substance. 4,037,353, Cl. 43-129.000.

Hennequin, Francois Maurice. Method for producing sheets of small uniform thickness. 4,038,352, Cl. 264-81.000.

Henrich, Victor E.; and Fan, John C. C., to Massachusetts Institute of Technology. Material and method of making secondary-electron emitters. 4,038,216, Cl. 252-514.000.

Heraty, Patrick T. Coin vault. 4,037,700, Cl. 194-1.00B.

Herberg, Klaus: *See*—
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.

Hercules Incorporated: *See*—
Dehm, Henry C., 4,038,115, Cl. 149-19.800.
Kramer, Brian D., 4,038,253, Cl. 260-47.00R.

Hermann Berstorff Maschinenbau GmbH: *See*—
Sander, Gottfried, 4,038,012, Cl. 425-363.000.

Hess, Charles W., to Speco, Inc. Method of producing a radial arm-type meat grinder cutter blade. 4,037,494, Cl. 76-101.00A.

Hesselbo, Torben: *See*—
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.

Hesston Corporation: *See*—
White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, 4,037,528, Cl. 100-191.000.

Hetke, Adolf: *See*—
Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., 4,037,643, Cl. 164-58.000.

Hewitt, Roger John Arthur; and Cross, Nigel Terence, to GKN Transmissions Limited. Motor vehicle drive system. 4,037,693, Cl. 192-3.560.

Heykants, Jozef J. P.: *See*—
Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.

Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., to Westinghouse Electric Corporation. Controlled post-synchronizing on brushless synchronous motors. 4,038,589, Cl. 318-174.000.

Hiab-Foco Aktiebolag: *See*—
Gustafsson, Hans Eric Karl, 4,037,742, Cl. 214-138.00R.

Higashiyama, Tatsuo; and Sakata, Isao, to Toyo Hakka Kobyo Kabushiki Kaisha. Menthol glycoside, process for preparing the same and method for releasing menthol therefrom. 4,038,270, Cl. 536-4.000.

High, Robert Edward, to Pennwalt Corporation. Decanter centrifuge apparatus. 4,037,781, Cl. 233-7.000.

Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, to Nakagawa Corrosion Protecting Co., Ltd. Galvanic anode type cathodic protection apparatus. 4,038,168, Cl. 204-197.000.

Hildebolt, William M., to Campbell Soup Company. Protein texturization by steam injection. 4,038,431, Cl. 426-511.000.
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., to Campbell Soup Company. Protein texturization by steam injection. 4,038,432, Cl. 426-511.000.
Hildebrand, George. Dog height measuring wicket. 4,037,327, Cl. 33-169.00R.
Hill, Jan, to AB Tellusond. Method and device for examining pulp for the presence of shives. 4,037,966, Cl. 356-102.000.
Hill, Joseph M.: *See*—
Dorn, Gordon L.; and Hill, Joseph M., 4,038,150, Cl. 195-127.000.
Hill, Nigel; and Sutton, James Anthony, to Dowty Mining Equipment Limited. Mine roof support. 4,037,419, Cl. 61-45.00D.
Hillman, Theodore E., to Conwed Corporation. Method and apparatus for perforating fibrous board surfaces in non-repetitive patterns. 4,037,499, Cl. 83-1.000.
Hillyer, Michael J.; and Madison, Victor J., to General Signal Corporation. Coil terminating means. 4,038,573, Cl. 310-71.000.
Hinckley, George B.: *See*—
Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., 4,038,385, Cl. 424-166.000.
Hines, Charles E.; and Williams, Dwight E., to Outboard Marine Corporation. Vehicle canopy. 4,037,614, Cl. 135-5.00A.
Hinson, Virgil: *See*—
Jarman, Davis R., 4,037,456, Cl. 72-325.000.
Hinton, Deborah M.: *See*—
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.
Hirabayashi, Kazuyoshi: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.
Hiraishi, Yoshinobu: *See*—
Tokimoto, Tadashi; and Hiraishi, Yoshinobu, 4,038,370, Cl. 423-336.000.
Hiramoto, Midori: *See*—
Mizuno, Yukio; and Hiramoto, Midori, 4,037,407, Cl. 60-277.000.
Hirano, Hironori: *See*—
Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.
Hirano, Takeaki: *See*—
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, to Juki Co., Ltd. Knife operating device for sewing machines. 4,037,548, Cl. 112-123.00R.
Hirohata, Hyogo: *See*—
Kinugasa, Terukazu; and Hirohata, Hyogo, 4,038,457, Cl. 428-411.000.
Hirsch, Irving: *See*—
Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.
Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., to General Dynamics Corporation. Control system for rolling missile with target seeker head. 4,037,806, Cl. 244-3.160.
Hirschauer, Andre: *See*—
Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.
Hirschfeld, Tomas, to Block Engineering, Inc. Proportional diluter. 4,037,760, Cl. 222-145.000.
Hirschmann, Ralph F.; and Veber, Daniel F., to Merck & Co., Inc. Pyridyl-4-methyl-succinimidocarbonate and process for its preparation. 4,038,282, Cl. 260-295.00D.
Hirschmann, Ralph F.: *See*—
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 4,038,306, Cl. 260-479.00S.
Hisagi, Takashi: *See*—
Inaba, Yoshio; and Hisagi, Takashi, 4,038,002, Cl. 425-136.000.
Hitachi, Ltd.: *See*—
Ito, Tosikatu; and Takahashi, Reijiro, 4,037,651, Cl. 165-30.000.
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,038,060, Cl. 62-36.000.
Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, 4,037,890, Cl. 308-187.000.
Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.
Takeda, Yasutsugu; and Tsunoda, Yoshito, 4,037,919, Cl. 350-3.500.
Uchida, Kenji; and Fujita, Kenichi, 4,037,992, Cl. 417-102.000.
Hively, Vern J. Portable crimping device. 4,037,629, Cl. 140-106.000.
Hoag, Peter J.: *See*—
Sandrock, Don G.; and Hoag, Peter J., 4,037,682, Cl. 180-69.00R.
Hoagland, Kenneth A., to Fairchild Camera and Instrument Corporation. Charge-coupled device video-signal-generating system. 4,038,690, Cl. 358-213.000.
Hoback, Ronald D., to Goodyear Tire & Rubber Company, The. Belt drive and belts and pulleys therefor. 4,037,485, Cl. 74-229.000.
Hobart Corporation: *See*—
Grunewald, Ernst, 4,038,103, Cl. 134-10.000.
Hobson, Stephan C., to Portec, Inc. Cotter pin. 4,037,513, Cl. 85-8.300.
Hoch, Helmut; and Quadbeck-Seeger, Hans-Juergen, to BASF Aktiengesellschaft. Production of 2-hydroxynaphthalene-3-carboxylic acid. 4,038,309, Cl. 260-520.00A.
Hochstein, Peter A. Thermal energy converting assembly. 4,037,411, Cl. 60-527.000.
Hodge, Lee Roy, to Hughes Tool Company. Shaft drill break-out system. 4,037,672, Cl. 173-157.000.
Hoeberechts, Arthur Marie Eugene; and Carasso, Marino Giuseppe, to U.S. Philips Corporation. Semiconductor device for storing and non-destructively reading image information and memory system comprising such a device. 4,038,606, Cl. 328-124.000.
Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,038,281, Cl. 260-296.00H.
Denzel, Theodor; and Hoehn, Hans, 4,038,283, Cl. 260-295.50B.
Hoehn, Marvin M.: *See*—
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.
Hoerner Waldorf Division - Champion Int. Corporation: *See*—
Roccaforte, Harry I., 4,037,717, Cl. 206-45.140.
Hoesterey, Howard F., to Philco Corporation. Tracking and sighting instrument. 4,038,547, Cl. 250-338.000.
Hoffa, Jack L.: *See*—
Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.
Hoffman, Alfred J. Board game apparatus. 4,037,843, Cl. 273-131.0AB.
Hoffman-La Roche Inc.: *See*—
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Hoffmann-La Roche Inc.: *See*—
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.
Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,038,272, Cl. 260-239.55R.
Hoffmann, Werner; and von Fraunberg, Karl, to BASF Aktiengesellschaft. 1-Methyl-2-halogenomethyl-3-isopropenyl-cyclopent-1-enes. 4,038,330, Cl. 260-648.00C.
Holan, George: *See*—
Evans, John James Alexander; and Holan, George, 4,038,405, Cl. 424-269.000.
Holland, Andrew P. Automatic cigarette snuffer and disposal device. 4,037,611, Cl. 131-237.000.
Hollander, John M. Used vehicle parts disassembly system and method. 4,037,302, Cl. 29-403.000.
Holleran, Louis M.: *See*—
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
Holm, LeRoy W., to Union Oil Company of California. Micellar flooding process for recovering oil from petroleum reservoirs. 4,037,659, Cl. 166-273.000.
Holmes, Arthur: *See*—
Hopkins, John Leslie; and Holmes, Arthur, 4,037,559, Cl. 116-133.000.
Holst, Johan Wilhelm Isaachsen. Tube fly, and method for its production. 4,037,346, Cl. 43-42.140.
Holte, Paul C.: *See*—
Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.
Holtey, Thomas O.: *See*—
Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., 4,038,537, Cl. 235-153.0AM.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okamoto, Yoshinori; and Tsuruoka, Toshio, 4,037,471, Cl. 73-324.000.
Honeywell Inc.: *See*—
Mott, Richard C., 4,037,625, Cl. 138-46.000.
Quarton, William T., 4,038,668, Cl. 235-151.000.
Roberts, James L., 4,038,540, Cl. 235-181.000.
Honeywell Information Systems, Inc.: *See*—
Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., 4,038,537, Cl. 235-153.0AM.
Honjo, Satoru: *See*—
Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
Hook, John Laurence, to Gainsborough Hardware Industries, Pty., Ltd. Door furniture mounting. 4,037,865, Cl. 292-357.000.
Hooker Chemicals & Plastics Corporation: *See*—
Schwartz, Willis T., Jr., 4,038,341, Cl. 260-862.000.
Schwartz, Willis T., Jr., 4,038,342, Cl. 260-862.000.
Hooker, Donald E., to Bally Manufacturing Corporation. Amusement apparatus. 4,037,845, Cl. 273-138.00A.
Hopf, Walter: *See*—
Tarmann, Rainer; and Hopf, Walter, 4,037,644, Cl. 164-61.000.
Hopkins, John Leslie; and Holmes, Arthur. Milk requirement indicator. 4,037,559, Cl. 116-133.000.
Hopper, Larry R., to Petrolite Corporation. Fire extinguisher containing a high internal phase ratio emulsion as fire extinguishing agent. 4,037,665, Cl. 169-49.000.
Horikawa, Kazuo: *See*—
Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
Hornbaker, Edwin D.: *See*—
Eisenbraun, Allan A.; and Hornbaker, Edwin D., 4,038,344, Cl. 260-879.000.
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Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., 4,037,848, Cl. 277-37.000.
Horowitz, Charles, to Sloan Valve Company. Empty and load sensing valve. 4,037,879, Cl. 303-23.00R.
Horton, Edward L.: *See*—
Rose, James J.; and Horton, Edward L., 4,037,290, Cl. 15-345.000.

Horwinski, Elwood R., to Product Concepts, Inc. Internally illuminated switch plate. 4,038,582, Cl. 315-129.000.
Hosoe, Kazuya: *See*—
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
Hou, Shou L.; and Carnahan, Robert D., to Gould Inc. Ink jet ink supply system. 4,038,667, Cl. 346-140.00R.
Houilleres du Bassin de Lorraine: *See*—
Deruelle, Jean; and Penet, Olivier, 4,038,153, Cl. 201-27.000.
Hounsell, Melvin Wayne: *See*—
Miller, Lowell Donald; Hounsell, Melvin Wayne; and Spinner, Ernest Elliott, 4,038,148, Cl. 195-127.000.
How, James Charles, to James How Industries Limited. Strings for musical instruments. 4,037,506, Cl. 84-297.00S.
Howard Hall & Company: *See*—
Young, David W., 4,038,434, Cl. 426-544.000.
Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., to H. H. Robertson Company. Foamed-in-place double-skin building panel. 4,037,377, Cl. 52-309.900.
Hubacher, Eric M.: *See*—
Bove, Ronald; and Hubacher, Eric M., 4,038,599, Cl. 324-158.00F.
Hubbard, Michael James. Tapestry holder. 4,037,640, Cl. 160-398.000.
Hucks, Uwe: *See*—
Vernaleken, Hugo; and Hucks, Uwe, 4,038,252, Cl. 260-47.0XA.
Huempfner, David F.; and Tringali, Richard C., to American Hospital Supply Corporation. Caster and swivel lock assembly. 4,037,291, Cl. 16-35.00R.
Huenniger, Edward A.; and Spurrell, Robert M., to United Technologies Corporation. Two dimensional nozzle with rotating plug. 4,037,405, Cl. 60-229.000.
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, to International Business Machines Corporation. Anti-static magnetic record disk assembly. 4,038,693, Cl. 360-99.000.
Huffman, Fred A. Writing instrument. 4,037,975, Cl. 401-6.000.
Hughes Aircraft Company: *See*—
Chapman, Charles Weldon; and Bristol, Thomas W., 4,038,614, Cl. 333-30.00R.
Hughes Tool Company: *See*—
Hodge, Lee Roy, 4,037,672, Cl. 173-157.000.
Hugl, Herbert; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Process for dyeing polyurethane resins. 4,038,240, Cl. 260-37.00N.
Hukki, Risto Tapani. Apparatus for controlling discharge of classified sand from a hydraulic classifier. 4,038,178, Cl. 209-161.000.
Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., to Dependable-Fordath, Inc. Mixing apparatus having plurality of different blades with multiple functions. 4,037,826, Cl. 259-8.000.
Hundt, Murray T.: *See*—
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.
Hunger, George A., Jr.: *See*—
Gildersleeve, Oliver DeP., Jr.; and Hunger, George A., Jr., 4,038,557, Cl. 290-1.00R.
Hunt, Kevin: *See*—
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Hunter, Tracy A.: *See*—
Trompeter, Emanuel; Hunter, Tracy A.; and Azelton, Claud, 4,037,909, Cl. 339-177.00R.
Hurst, John, to W. R. Grace Limited. Separator for concrete wrapping to submarine pipelines. 4,037,627, Cl. 138-175.000.
Hutcheson, William A.: *See*—
Pflueger, John M.; and Hutcheson, William A., 4,037,563, Cl. 119-5.000.
Hutchinson, Eugene Byron: *See*—
Hengen, Edward John; and Hutchinson, Eugene Byron, 4,037,745, Cl. 214-521.000.
Huther, Jerome W. Vertical axis wind turbine rotor. 4,037,989, Cl. 416-197.00A.
Hwa, Fu: *See*—
Fano, Joseph D.; and Hwa, Fu, 4,037,867, Cl. 294-19.00R.
Hwang, Frank Kwangming, to Bell Telephone Laboratories, Incorporated. Efficient rearrangeable multistage switching networks. 4,038,638, Cl. 340-166.00R.
Hyatt, Gilbert P.: *See*—
Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.
Hyldon, Roy G.: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,038,437, Cl. 426-656.000.
I.C.S. Ignition Control Systems Ltd.: *See*—
Filip, Stanislaw F., 4,038,506, Cl. 200-83.00J.
I-T-E Imperial Corporation: *See*—
Clement, Ralph C., 4,037,917, Cl. 339-259.00F.
Gryctko, Carl E., 4,038,618, Cl. 335-23.000.
Haydu, John L.; Fenneteau, Michel M.; and Mann, Pyron C., 4,038,626, Cl. 337-4.000.
Iacono, John Q. Multiple bottle carrier. 4,037,766, Cl. 224-45.0AA.
Ichiyanagi, Toshikazu: *See*—
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
ICN Pharmaceuticals, Inc.: *See*—
Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., 4,038,480, Cl. 536-27.000.
Ide, Thomas N., to Stratoflex, Inc. Air cleaner and dryer. 4,038,051, Cl. 55-218.000.
Ideal Industries, Inc.: *See*—
Lucas, James F., 4,037,905, Cl. 339-98.000.
Ido, Kazuo; and Saito, Shizuo, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Liquid crystal display cell driving circuit. 4,037,931, Cl. 350-160.0LC.
Ieki, Hideharu: *See*—
Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, 4,038,615, Cl. 333-72.000.
Ihida, Mutsumi: *See*—
Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, 4,038,366, Cl. 423-234.000.
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, to Furuno Electric Company. Indication device in plan position indication system. 4,038,654, Cl. 343-5.0EM.
Ikeda, Hiroshi: *See*—
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY.
ILC Technology, Inc.: *See*—
Noble, Lowell A.; Grossman, Leonard N.; and Marlowe, Mickey O., 4,038,117, Cl. 156-2.000.
Imai, Toshihiro: *See*—
Yamashita, Nobuo; and Imai, Toshihiro, 4,037,938, Cl. 350-202.000.
IMC Chemical Group, Inc.: *See*—
Griffith, George L., 4,037,536, Cl. 102-20.000.
Imperial Chemical Industries Inc.: *See*—
Boyes, Bryan; and Jones, Alan, 4,038,357, Cl. 264-168.000.
Imperial Chemical Industries Limited: *See*—
Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, 4,037,538, Cl. 102-23.000.
Benson, Nigel Colin; and Mehta, John Dorab, 4,038,121, Cl. 156-157.000.
Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, 4,038,234, Cl. 260-29.60F.
Charlton, John Stuart, 4,038,548, Cl. 250-357.000.
Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, 4,038,231, Cl. 260-29.60F.
Jaques, Geoffrey Sanderson, 4,038,350, Cl. 264-22.000.
Ogden, Keith; and Quinby, John, 4,038,244, Cl. 260-42.160.
Remmington, Timothy Alan; and Robinson, William, 4,038,354, Cl. 264-102.000.
Inaba, Yoshio; and Hisagi, Takashi, to Toyobo Co., Ltd. Pelletizer. 4,038,002, Cl. 425-136.000.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, to Kao Soap Co., Ltd. Tricycli Bredt Compound, Tricyclo[5.3.1.0^{3,8}]Undec-2-ene. 4,038,333, Cl. 260-666.0PY.
Indian Head Inc.: *See*—
Pate, Harold T., 4,037,810, Cl. 248-68.0CB.
Industrial & Marine Services (Scotland) Limited: *See*—
Moody, Isaac N., 4,037,582, Cl. 126-116.00R.
Industrial Mining Machinery Company: *See*—
Francis, Peter M., 4,037,796, Cl. 241-59.000.
Industriewerk Schaeffler OHG: *See*—
Jahn, Rudolf; and Toth, Arpad, 4,037,892, Cl. 308-194.000.
Infra-Vision Ltd. Zug: *See*—
Seitz, Hermann, 4,038,670, Cl. 354-96.000.
Infranor S.A.: *See*—
Clement, Gilbert-Louis, 4,037,982, Cl. 408-61.000.
Ingenjorsfirman N.A. Sandbergs Industrikonstruktioner AB: *See*—
Sandberg, Nils Arne, 4,037,335, Cl. 37-58.000.
Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, to Ciba-Geigy Corporation. Polymer compositions containing a bisazomethine pigment. 4,038,241, Cl. 260-39.00P.
Innerspace Corporation: *See*—
Gongwer, Calvin A., 4,037,615, Cl. 137-1.000.
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, to Taihou Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Vehicle air conditioning compressor. 4,037,522, Cl. 92-71.000.
Inoue, Atushi: *See*—
Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, 4,038,615, Cl. 333-72.000.
Inoue, Hiroshi; Yoda, Makoto; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the production of polyolefin powder. 4,038,477, Cl. 528-487.000.
Institut Armand Frappier: *See*—
Turcotte, Raymond; and Quevillon, Marc, 4,038,142, Cl. 195-96.000.
Institut Francais du Petrole: *See*—
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Institut Francais du Petrole et Institut des Corps Gras (ITERG): *See*—
Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.
Institute of Gas Technology: *See*—
Meissner, Herman P.; and Schora, Frank C., 4,037,653, Cl. 165-1.000.
Instituto de Farmacologia Espanola, S.L. (Fundacion Marques de Urquijo): *See*—
Ferns, Ricardo Segura, 4,038,419, Cl. 426-12.000.
Intel Corporation: *See*—
Mehta, Rustam; and Dreyer, Stephen F., 4,038,646, Cl. 340-173.00R.
Interhydro A. G.: *See*—
Baumann, Gerhard, 4,037,363, Cl. 47-59.000.

International Biomedical Laboratories, Inc.: *See—*
Serur, Juan Ricardo, 4,038,192, Cl. 210-321.00B.

International Business Machines Corporation: *See—*
Belleson, James Garman; and Clark, Kendall, 4,037,941, Cl. 350-285.000.
Belleson, James Garman; and Clark, Kendall, 4,037,971, Cl. 356-199.000.
Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, 4,037,912, Cl. 339-198.00R.
Birney, Richard Eugene; and Davis, Michael Ian, 4,038,645, Cl. 364-200.000.
Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, 4,038,641, Cl. 364-900.000.
Bouknecht, Max Abbott; Davis, Michael Ian; and Vergari, Louis Peter, 4,038,642, Cl. 364-900.000.
Bove, Ronald; and Hubacher, Eric M., 4,038,599, Cl. 324-158.00F.
Champ, Robert Bruce; and Shattuck, Meredith David, 4,037,928, Cl. 350-160.00R.
Feng, Bai-Cwo, 4,038,110, Cl. 148-187.000.
Gibson, Roy Morris; and Sprokel, Gerard John, 4,038,439, Cl. 427-38.000.
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, 4,038,693, Cl. 360-99.000.
Ku, Ta Cheng; and Stiles, Donald Joseph, 4,037,707, Cl. 197-53.000.
Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.
Orlando, Anthony William; and Schultz, Frederick Arthur, 4,037,732, Cl. 214-1.0BB.
Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, 4,037,830, Cl. 269-21.000.

International Harvester Company: *See—*
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 4,037,473, Cl. 73-346.000.

International Minerals & Chemical Corporation: *See—*
Traxler, James T.; Lira, Emil Patrick; and Kraemer, John F., 4,038,097, Cl. 106-288.00B.

International Nickel Company, Inc., The: *See—*
Bell, Malcolm Charles Evert; Eerkes, Thijs; and Sridhar, Ramamritham, 4,038,066, Cl. 75-29.000.

International Ore Technology, Inc.: *See—*
Posel, John G., 4,038,361, Cl. 423-34.000.

International Standard Electric Corporation: *See—*
Bachinger, Peter, 4,037,884, Cl. 308-2.00R.
Brewster, Arthur Edward, 4,038,653, Cl. 343-6.80R.

International Telephone and Telegraph Corporation: *See—*
Anhalt, John W.; and Curley, James H., 4,037,911, Cl. 339-217.00S.
Arnold, Bruce K.; and Yamamoto, Stephen K., 4,037,904, Cl. 339-64.00R.
Borofka, Robert P.; and Barton, Lynn R., 4,038,612, Cl. 331-178.000.
Bradford, George J., 4,037,783, Cl. 236-49.000.
Miller, Charles Eveleigh, 4,037,461, Cl. 73-32.00A.
Munroe, Patrick Oliver, 4,037,786, Cl. 237-19.000.
November, Milton H.; and Lyon, LaVerne D., 4,037,460, Cl. 73-32.00A.
Schlatter, Gerald L., 4,037,459, Cl. 73-32.00A.
Soderberg, Roy E.; and Hanssen, Albert J., 4,037,818, Cl. 251-121.000.

Intreprinderea De Radiatoare Si Cabluri: *See—*
Barozzi, Dan Alexandru; Calin, Valentin; and Peter, Zsigmond, 4,037,774, Cl. 228-183.000.

Inventa AG fur Forschung und Patentverwertung: *See—*
Wampetich, Matthias Johann, 4,038,455, Cl. 428-378.000.

Iowa State University Research Foundation, Inc.: *See—*
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Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Puncture-proof tires. 4,037,635, Cl. 152-301.000.

Irlbeck, Dennis Henry: *See—*
Morrell, Albert Maxwell; and Irlbeck, Dennis Henry, 4,037,936, Cl. 350-189.000.

Isaac, Otto; Posselt, Klaus; and Uthemann, Horst, to Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler. Derivative of desglucohellebrin and therapeutic use. 4,038,386, Cl. 424-182.000.

Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Multicylinder internal combustion engine. 4,037,571, Cl. 123-52.00R.

Ishihara, Tetsuo: *See—*
Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,038,449, Cl. 428-220.000.

Ishikawajima-Harima Jukogyo Kubushiki Kaisha: *See—*
Terada, Yoshimi; and Fujii, Akira, 4,037,869, Cl. 294-104.000.

Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, to Murata Manufacturing Co., Ltd. Elastic surface wave device. 4,038,615, Cl. 333-72.000.

Iten, Clemens A.; and Sykes, Malcolm B., to Philip Morris Incorporated. Double edge blade razor. 4,037,321, Cl. 30-47.000.

Ithaca Textiles, Inc.: *See—*
Wehrmann, Nicholas, 4,037,436, Cl. 66-186.000.

Ito, Roy Atsushi: *See—*
Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, 4,038,655, Cl. 343-5.00W.

Ito, Tosikatu; and Takahashi, Reijiro, to Hitachi, Ltd. Temperature control apparatus of air conditioner for automobiles. 4,037,651, Cl. 165-30.000.

ITT Industries, Inc.: *See—*
Drake, Cyril Francis; and Amos, Robert Walter James, 4,038,430, Cl. 427-248.00E.

ITW de France, S.A.: *See—*
Morel, Henri, 4,037,489, Cl. 74-548.000.

Ivac Corporation: *See—*
Georgi, Heinz W., 4,037,598, Cl. 128-214.00E.

Ivanov, Georgy Nikolaevich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Ivens, Gunter: *See—*
Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, 4,038,550, Cl. 250-358.00P.

Ivey, John Saxon, to Borg-Warner Corporation. Centrifugal lock up clutch for fluid couplings. 4,037,691, Cl. 192-3.310.

Iwasawa, Naozumi: *See—*
Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, 4,038,225, Cl. 260-21.000.

J. C. Penney Company: *See—*
DeSisto, Frank Alfred, 4,037,729, Cl. 211-208.000.

J. I. Case Company: *See—*
McDonald, Raymond F., 4,037,284, Cl. 15-83.000.
Pedersen, Carl Oluf, 4,037,743, Cl. 214-140.000.
Zyduck, Ronald L., 4,037,878, Cl. 303-13.000.

J. K. and Susie L. Wadley Research Institute and Blood Bank: *See—*
Dorn, Gordon L.; and Hill, Joseph M., 4,038,150, Cl. 195-127.000.

J. M. Huber Corporation: *See—*
Wason, Satish K., 4,038,098, Cl. 106-288.00B.

J. P. Elliott Associates, Inc.: *See—*
Elliott, Jack P., 4,037,613, Cl. 134-83.000.

J. Ray McDermott & Co. Inc.: *See—*
deBoer, Nico; and Olsen, Robert L., 4,037,422, Cl. 61-72.400.

Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., to Cessna Aircraft Company, The. Hydraulic control valve. 4,037,410, Cl. 60-445.000.

Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,038,401, Cl. 424-267.000.

Jackson, William Nelson, to United States of America, Army. Engine condition calculating device. 4,037,782, Cl. 235-84.000.

Jacobs, Daniel, to Form-Scaff (Proprietary)Limited. Scaffolding. 4,037,382, Cl. 52-638.000.

Jacobson, Evan C.; and Becker, Stephen R. Power operated guitar device. 4,037,503, Cl. 84-9.000.

Jacoby, Charles H., to Akzona Incorporated. Dust entrapment composition and method therefor. 4,038,443, Cl. 427-136.000.

Jacquelin, Jean, to Compagnie Generale d'Electricite S.A. Zinc-air electrochemical cell. 4,038,458, Cl. 429-15.000.

Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. Amines and processes for their manufacture. 4,038,414, Cl. 424-304.000.

Jackle, William M., to Southern Pacific Transportation Company. Train tunnel ventilation method and apparatus. 4,037,526, Cl. 98-49.000.

Jahn, Rudolf; and Toth, Arpad, to Industriewerk Schaeffler OHG. Radial roller bearing for two parallel shafts. 4,037,892, Cl. 308-194.000.

Jakob, Herbert Edward. Fluid motor apparatus. 4,037,520, Cl. 91-224.000.

James How Industries Limited: *See—*
How, James Charles, 4,037,506, Cl. 84-297.00S.

James, Varnell L., to Boeing Company, The. Three dimensional composite structure and method for incorporating fittings. 4,038,118, Cl. 156-143.000.

Jamieson, John; and Price, Henry F., to Bell & Howell Company. Microfilm camera and photographic film handling apparatus. 4,037,955, Cl. 355-54.000.

Janes, George Sargent; and Levy, Richard H., to Jersey Nuclear-Avco Isotopes, Inc. Isotopically selective excitation from plural excited states. 4,038,549, Cl. 250-423.00P.

Janome Sewing Machine Co.: *See—*
Hanyu, Susumu; and Amano, Takashi, 4,037,549, Cl. 112-258.000.

Janssen Pharmaceutica N.V.: *See—*
Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.

Japan Inorganic Material Co., Ltd.: *See—*
Kawai, Kyosuke, 4,038,089, Cl. 106-50.000.

Jaques, Geoffrey Sanderson, to Imperial Chemical Industries Limited. Method of producing integral non-foamed skin layer shaped articles. 4,038,350, Cl. 264-22.000.

Jaquish, John, to Trans World Display Corporation. Display-dispenser rack. 4,037,756, Cl. 221-242.000.

Jarish, Basil, to Quebec Iron & Titanium Corporation-Fer et Titane due Quebec, Inc. Upgrading sorelslag for production of synthetic rutile. 4,038,363, Cl. 423-82.000.

Jarman, Davis R., to Hinson, Virgil, a part interest. Auto body clamp. 4,037,456, Cl. 72-325.000.

Jasinski, Stefan A., to Xerox Corporation. Cleaning apparatus for a corona generating device. 4,038,546, Cl. 250-324.000.

Jaworek, Dieter; Maier, Joseph; and Nelbock-Hochstetter, Michael, to Boehringer Mannheim G.m.b.H. Process for binding biologically active proteins. 4,038,140, Cl. 195-63.000.

Jayne, Max Leroy, to GTE Sylvania Incorporated. Electrical connector and contact. 4,037,906, Cl. 339-107.000.

Jeanmart, Claude: *See*—
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.

Jenaer Glaswerk Schott & Gen.: *See*—
Gliemeroth, Georg, 4,038,090, Cl. 106-53.000.

Jenkins, Richard Stuart. Oil spill recovery method and apparatus. 4,038,182, Cl. 210-23.00R.

Jenner, Michael D.: *See*—
Blackman, Morris V.; and Jenner, Michael D., 4,037,311, Cl. 29-593.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Janes, George Sargent; and Levy, Richard H., 4,038,549, Cl. 250-423.00P.

Jeschke, Norbert, to Samson Apparatebau AG. Three-point regulator with feedback. 4,037,619, Cl. 137-492.500.

Jespersen, Knud; and Engman, Theodore Edgar. Process for pickling meat sections. 4,038,426, Cl. 426-266.000.

Jewell, John N.: *See*—
Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.

Jido, Morio: *See*—
Yamaga, Joji; and Jido, Morio, 4,038,511, Cl. 219-121.00P.

Jimenez, James A., to Electra Food Machinery, Inc. Grinding apparatus. 4,037,801, Cl. 241-247.000.

Jobe, Garland Ralph: *See*—
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.

Johannes, Steinwart: *See*—
Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.

John Wyeth & Brother Limited: *See*—
Archibald, John Leheup; and Jackson, John Lambert, 4,038,401, Cl. 424-267.000.

Johns-Manville Corporation: *See*—
Beranek, Robert Louis, Jr.; and Timms, Donny Lee, 4,038,356, Cl. 264-160.000.
Necker, Carl George; and Colwell, Richard Rial, 4,037,462, Cl. 73-32.00R.
Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.
Patry, Francis Joseph, 4,037,372, Cl. 52-96.000.

Johnson, Alexander Lawrence, to Du Pont de Nemours, E. I., and Company. 1-(2-Carboxyaryl)-4-arylimidazoles and 1-(2-carboxyaryl)-3-aryl-1,2,4-triazoles. 4,038,285, Cl. 260-309.000.

Johnson, Brant T. Electro-thermal isolating switch. 4,038,627, Cl. 337-107.000.

Johnson, Bruce K.: *See*—
Whiteside, George D.; and Johnson, Bruce K., 4,038,674, Cl. 354-230.000.

Johnson Controls, Inc.: *See*—
Matthews, Russell Byron, 4,038,019, Cl. 431-51.000.

Johnson, Donald Lee: *See*—
Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.

Johnson, Harold O. Cutter hold down apparatus. 4,037,831, Cl. 269-306.000.

Johnson, Herbert G.: *See*—
Hall, Charles M.; and Johnson, Herbert G., 4,038,398, Cl. 424-263.000.

Johnson & Johnson: *See*—
Luceyk, Alfred Robert; Mouwen, Herman Charles; and Weinberg, Steven Louis, 4,038,194, Cl. 210-436.000.
Shultz, Jay S., 4,038,233, Cl. 260-29.6RW.

Johnson, Oliver Wendell, to Eaton Corporation. Controller for fluid pressure operated devices. 4,037,620, Cl. 137-596.000.

Johnson, Richard B., to American Chain & Cable Company, Inc. Transfer apparatus. 4,037,738, Cl. 214-38.0CC.

Johnson, Thomas W.: *See*—
Melcher, James R.; and Johnson, Thomas W., 4,038,052, Cl. 55-138.000.

Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., to Rohm and Haas Company. 1-Alkylpyrid-2-one. 4,038,065, Cl. 71-76.000.

Johnston, Katharine Gentry; and Greyson, Jerome, to Miles Laboratories, Inc. Test composition, device, and method. 4,038,485, Cl. 23-230.00B.

Johnston, Thomas; and Youens, Frederick Peter, to Short Brothers and Harland Limited. Flight vehicle. 4,037,807, Cl. 244-7.00B.

Jones, Alan: *See*—
Boyes, Bryan; and Jones, Alan, 4,038,357, Cl. 264-168.000.

Jones, Charles, to Curtiss-Wright Corporation. Compound spark-ignition and diesel engine. 4,037,412, Cl. 60-605.000.

Jones, Derick; and Lu, Sun, to Texas Instruments Incorporated. Lyotropic nematic liquid crystals for use in electro-optical display devices. 4,038,199, Cl. 252-299.000.

Jones, Derick; and Lu, Sun, to Texas Instruments Incorporated. Lyotropic nematic liquid crystals for use in electro-optical display devices. 4,038,200, Cl. 252-299.000.

Jones, J. Paul. Thermal barrier. 4,037,639, Cl. 160-133.000.

Jones, Paul W.: *See*—
Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., 4,038,151, Cl. 195-127.000.

Jones, Robert Henry Wellons, Jr.: *See*—
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.

Jordan, Bertram L.: *See*—
Mitchell, John D.; and Jordan, Bertram L., 4,037,391, Cl. 56-27.500.

Jovick, Raymond John: *See*—
Fisher, Frank H.; and Jovick, Raymond John, 4,037,690, Cl. 188-181.00R.

Juki Co., Ltd.: *See*—
Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, 4,037,548, Cl. 112-123.00R.

Julia, Marc: *See*—
Chabardes, Pierre; and Julia, Marc, 4,038,323, Cl. 260-607.0AR.

Juni, Elliot, to University of Michigan, The Regents of the. Test kit for the genetic detection of microorganisms. 4,038,143, Cl. 195-100.000.

Justice, James Conley, to Coaltex, Inc. Full face miner. 4,037,875, Cl. 299-31.000.

Justman, Daniel B., to Reed Tool Company. Roller cutter drill bit. 4,037,673, Cl. 175-371.000.

K. R. Evans & Associates: *See*—
Newsom, William D.; and Carnahan, James R., 4,037,660, Cl. 166-302.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Chihara, Hiroyuki, 4,037,399, Cl. 58-23.0BA.
Ido, Kazuo; and Saito, Shizuo, 4,037,931, Cl. 350-160.0LC.
Tsutomu, Otake, 4,038,104, Cl. 136-89.00P.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Kadatz, Rudolf: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Kairbara, Iamo: *See*—
Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.

Kaliebe, Kenneth J., to Sprague Electric Company. Ceramic disc capacitor and method of making the same. 4,038,587, Cl. 361-321.000.

Kalnajs, Reinis: *See*—
Poklacki, Erwin Sigmund; and Kalnajs, Reinis, 4,038,207, Cl. 252-316.000.

Kamenev, Vladimir Fedorovich: *See*—
Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.

Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich. Method of effecting antihistaminic, antiserotonin and antiallergic actions. 4,038,402, Cl. 424-267.000.

Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, to Hitachi, Ltd. Apparatus for treating an exhaust gas from nuclear plant. 4,038,060, Cl. 62-36.000.

Kamp, Eugene L.; and Visos, Charles D., to Emerson Electric Co. Electromagnet with terminals. 4,038,623, Cl. 335-219.000.

Kamyr Valves Inc.: *See*—
Kindersley, Peter G., 4,037,819, Cl. 251-306.000.

Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, to Bristoline Inc. Valve assembly for a sphygmomanometer. 4,037,587, Cl. 128-2.05G.

Kanengieter, Glenn G.: *See*—
Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.

Kaniut, Herbert. Travelling tail-unit with circular arc motion. 4,037,808, Cl. 244-53.00B.

Kansai Paint Company, Ltd.: *See*—
Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, 4,038,225, Cl. 260-21.000.

Kantner, Otto: *See*—
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.

Kantor, Ilya Solomonovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Kantorski, Joseph W.: *See*—
Dusza, Robert J.; and Kantorski, Joseph W., 4,038,014, Cl. 425-388.000.

Kao Soap Co., Ltd.: *See*—
Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, 4,038,218, Cl. 252-542.000.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY.
Minegishi, Yutaka; and Arai, Haruhiko, 4,038,196, Cl. 252-8.800.

Kapanen, Aarne Albin; and Rautimo, Pentti Jaakkima, to Outokumpu Oy. Method and apparatus for detecting and eliminating short-circuits in an electrolytic tank. 4,038,162, Cl. 204-105.00R.

Kapfer, Vincent C., to United States of America, Air Force. Probe contact and junction detector. 4,038,598, Cl. 324-72.500.

Karassik, Igor J.; and Thaw, Charles H., to Worthington Pump, Inc. Flushing liquid system for the wearing ring in centrifugal pumps and the wearing ring assembly and wearing ring for use therein. 4,037,985, Cl. 415-175.000.

Karl, Curtis Lee, to General Mills Chemicals, Inc. Hydroxyalkyl locust bean/xanthomonas hydrophilic colloid blends. 4,038,206, Cl. 252-316.000.

Karsh, Herbert; and Gilchrist, Edgar S., to Bell & Howell Company. Tape transporting apparatus. 4,037,767, Cl. 226-7.000.

Karvinen, Jaakko: *See—*
Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, 4,038,223, Cl. 260-9.000.

Kasai, Masayoshi: *See—*
Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.

Kaszuba, Edward H. Electrical safety socket. 4,037,901, Cl. 339-41.000.

Kataoka, Shigeyuki: *See—*
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.

Katayanagi, Akira. Hydrochloric acid flotation process for separating feldspar from siliceous sand. 4,038,179, Cl. 209-166.000.

Kato, Makoto, to Matsushita Electric Industrial Co., Ltd. Fourier-transform holography by pseudo-random phase shifting. 4,037,918, Cl. 350-3.500.

Katz, Sheldon N.: *See—*
Collins, David R.; and Katz, Sheldon N., 4,037,378, Cl. 52-397.000.

Kawabata, Hidetoshi: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.

Kawai, Kyosuke, to Japan Inorganic Material Co., Ltd. Process for producing vitreous fibers containing cement as major constituent. 4,038,089, Cl. 106-50.000.

Kawai, Yoshihiko: *See—*
Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, 4,038,366, Cl. 423-234.000.

Kawaken Fine Chemicals Co., Ltd.: *See—*
Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, 4,038,287, Cl. 260-309.700.

Kawaki, Takao: *See—*
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.

Kawamoto, Hirohisa, to RCA Corporation. Four-layer trapatt diode and method for making same. 4,038,106, Cl. 148-1.500.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Sugimoto, Takao, 4,037,431, Cl. 64-14.000.

Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, to Takeda Chemical Industries, Ltd. Urethane prepolymer. 4,038,304, Cl. 260-468.00E.

Kearney, John A., to Bibb Company, The. Cellulosic textile materials having improved soil release and stain resistance properties. 4,038,027, Cl. 8-120.000.

Keating, James L.: *See—*
Wahl, Harold F.; and Keating, James L., 4,037,723, Cl. 209-104.000.

Keese, Beverly W., to Rockwell International Corporation. Drive axle outer end with brake and gearing. 4,037,694, Cl. 192-4.00A.

Kefalas A/S: *See—*
Lassen, Niels, 4,038,395, Cl. 424-250.000.

Kelly, Kristine M.: *See—*
Teller, Joseph D.; and Kelly, Kristine M., 4,038,029, Cl. 23-230.00B.

Kemlo, Kenneth Garry; and Gregc [illegible], to Broken Hill Proprietary Company Limited [illegible] levels in receptacles. 4,037,761, Cl. 222-590.000.

Kemmetmuller, Roland, to Waagner-Biro Aktiengesellschaft. Method and means for dry cooling bulk materials. 4,037,330, Cl. 34-20.000.

Kenmochi, Hirohito: *See—*
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Kennecott Copper Corporation: *See—*
Rappas, Alkis S.; and Pemsler, J. Paul, 4,038,070, Cl. 75-108.000.
Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., 4,038,298, Cl. 260-429.00J.

Kennedy, Robert J., Jr.; and Smith, Kendall S., II, to Lincoln Manufacturing Company, Inc. Tray slide and support therefor. 4,037,896, Cl. 312-281.000.

Kenney, George Churchill: *See—*
Day, Paul Edwin; and Kenney, George Churchill, 4,038,663, Cl. 346-1.000.

Kerstein, Melvin T.: *See—*
Pasturczak, Vincent S.; and Kerstein, Melvin T., 4,037,949, Cl. 352-158.000.

Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, to Toll Cryogenics, Inc. Method for deflashing small parts. 4,037,368, Cl. 51-314.000.

Kesselman, David A. Tamper resistant fastener. 4,037,515, Cl. 85-61.000.

Kessler, Hans-Joachim: *See—*
Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.

Key, James A. Minnow bucket with water aerating means. 4,037,349, Cl. 43-57.000.

Keydel, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Directional antenna for a projectile or rocket detonator. 4,037,540, Cl. 102-70.20P.

Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Coated baked goods. 4,038,422, Cl. 426-72.000.

Keyser, William L.: *See—*
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,038,423, Cl. 426-72.000.

Khare, Gyaneshwar Prasad. Radioimmunoassay for hepatitis B antigen. 4,038,378, Cl. 424-1.000.

Kiefer, Hans; and Naarmann, Herbert, to BASF Aktiengesellschaft. Production of N-(1-alkenyl)-carbamyl chlorides. 4,038,311, Cl. 260-544.00C.

Kieven, Gunter: *See—*
Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, 4,037,912, Cl. 339-198.00R.

Kim, Chung K.; and Cho, Yung L., to United States of America, Air Force. Method of hermetically sealing semiconductor devices. 4,038,157, Cl. 204-16.000.

Kim, Dongsung Robert, to Burroughs Corporation. Microprogramming control system. 4,038,643, Cl. 364-200.000.

Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, to Atlas Copco Aktiebolag. Drill boom with hydraulic parallel motion means. 4,037,671, Cl. 173-2.000.

Kimura, Tomohiko: *See—*
Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.

Kindersley, Peter G., to Kamyr Valves Inc. Butterfly valve having metal-to-metal sealing with conical angle-transported vane. 4,037,819, Cl. 251-306.000.

King, David P.; and Barker, Robert I., to Monsanto Company. Method and apparatus for measuring a dimension of an object in a defined space by scanning with a light beam. 4,037,968, Cl. 356-160.000.

King, Frederick N. Detection system for automobiles and other motor-driven objects. 4,038,633, Cl. 340-38.00L.

King, Harry A. Method of supplemental irrigation for farming. 4,037,787, Cl. 239-2.00R.

King, James E.: *See—*
Francel, Josef; King, James E.; and Woulbroun, John M., 4,038,091, Cl. 106-53.000.

King, Robert W., to Avco Corporation. Three dimensional fabric material. 4,038,440, Cl. 428-245.000.

Kintner, Paul M., to Cutler-Hammer, Inc. Ladder static logic control system and method of making. 4,038,562, Cl. 307-203.000.

Kinugasa, Terukazu; and Hirohata, Hyogo, to Matsushita Electric Industrial Co., Ltd. Fusible metal film resistor. 4,038,457, Cl. 428-411.000.

Kirchner, Jack R.: *See—*
Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., 4,038,151, Cl. 195-127.000.

Kirkendall, James H.: *See—*
Evans, Martin; and Kirkendall, James H., 4,038,650, Cl. 340-244.00R.

Kirkpatrick, Joel L.: *See—*
Doyle, William C., Jr.; and Kirkpatrick, Joel L., 4,038,387, Cl. 424-226.000.

Kitagawa, Yoshihiko: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000.

Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, to Seiko Koki Kabushiki Kaisha. Drive device for electric clock. 4,037,400, Cl. 58-23.00D.

Kitai, Kiyoshi; Saito, Takeo; and Seki, Youichi, to Seiko Koki Kabushiki Kaisha. System for indicating the operation of a self-timer in an electric shutter for camera. 4,038,675, Cl. 354-238.000.

Kitchens, Lee G.: *See—*
Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.

Klausmeier, Robert E.: *See—*
Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., 4,038,116, Cl. 149-105.000.

Kleimeyer, Vernon T.; and Schinner, Thomas J., to General Signal Corporation. Integrated card reader system. 4,038,522, Cl. 235-61.70B.

Klein, Klaus: *See—*
Bittermann, Dietmar; Huni, Kevin; Klein, Klaus; and Rau, Peter, 4,038,133, Cl. 176-38.000.

Kleinschmidt, Johann Otto, to Union Special G.m.b.H. Sewing machine apparatus for aligning and sewing pieces of textile fabric or the like. 4,037,546, Cl. 112-121.260.

Kleiter, Walter: *See—*
Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, 4,038,134, Cl. 176-65.000.

Klepsch, Christian. Apparatus for walking on water or land. 4,037,280, Cl. 9-310.00D.

Kletschka, Harold D.: *See—*
Rafferty, Edson Howard; and Kletschka, Harold D., 4,037,984, Cl. 415-60.000.

Klimek, Boleslaw M.; and Mastis, Victor, to Echlin Manufacturing Company, The. Tractor-trailer electrical receptacle. 4,037,907, Cl. 339-126.00R.

Kline, Kenneth J., to Envirex Inc. Scum control system for peripheral feed channel of sedimentation tank. 4,038,185, Cl. 210-83.000.

Kling, Alberto: *See*—
Stummer, Franz, 4,038,592, Cl. 363-165.000.
Klingberg, Anders William: *See*—
Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erick, 4,038,102, Cl. 106-316.000.
Klockner-Werke AG: *See*—
Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,962, Cl. 356-86.000.
Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,963, Cl. 356-86.000.
Kloster, William R.; and Stewart, Patrick H., to C L Industries, Inc. Automatic mold and core forming machine. 4,037,645, Cl. 164-161.000.
Knell, Martin; and Dexter, Martin, to Ciba-Geigy Corporation. Butadiene rubbers stabilized with thiodialkanoamidophenols. 4,038,246, Cl. 260-45.9NC.
Knickerbocker, Karl. Price setter for totalizer coin mechanism. 4,037,701, Cl. 194-1.00L.
Knifton, John F., to Texaco Inc. Processes for regenerating dispersions of ligand-stabilized, palladium(II) halide complexes used in carbonylation catalysts. 4,038,208, Cl. 252-412.000.
Knodler, Reinhard: *See*—
Baukal, Werner; Knodler, Reinhard; and Kuhn, Wolfgang Hermann, 4,038,464, Cl. 429-104.000.
Knott, Karl: *See*—
Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.
Knott, Robert F.; and Handlos, Arthur E., to Shell Oil Company. Butadiene recovery process. 4,038,156, Cl. 203-45.000.
Knowlton, Dennis J. Pulse code modulation radio control system. 4,038,590, Cl. 318-562.000.
Knutsen, Einar. Process for producing a connecting construction unit, such as a quay, container or platform. 4,037,423, Cl. 61-87.000.
Kobayashi, Akira: *See*—
Namba, Masanao; Kuniyoshi, Masateru; and Kobayashi, Akira, 4,038,624, Cl. 336-60.000.
Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, to Asahi Kasei Kogyo Kabushiki Kaisha. Bulky nonwoven fabric. 4,038,452, Cl. 428-224.000.
Kobinger, Walter: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Kobylak, Anthony M.: *See*—
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.
Koch, George Paul, to Fiat-Allis Construction Machinery, Inc. Combined steering and braking means for crawler tractor. 4,037,677, Cl. 180-6.700.
Koenst, John W., Jr.; and Mitchell, Edward, to Union Carbide Corporation. Method of casting tubular polysulfone ultrafiltration membranes in sand modules. 4,038,351, Cl. 264-45.100.
Koepke, Frederick W., to Centri-Spray Corporation. Reciprocating conveyor. 4,037,714, Cl. 198-750.000.
Koerber, Clement J., to Cincinnati Electronics Corporation. Signal to noise ratio indicating circuit. 4,038,604, Cl. 325-363.000.
Koerner, Dan W.: *See*—
Cook, K. Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., 4,037,465, Cl. 73-67.80S.
Kogan, Rita Moiseevna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Kolobnev, Ivan Filippovich; and Mishin, Georgy Yakovlevich. Aluminum-base alloy. 4,038,072, Cl. 75-142.000.
Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Electrostatic recording process and ionizing radiation image recording method employing the same. 4,038,545, Cl. 250-315.00A.
Komarov, Jury Ivanovich; Titov, Dmitry Vladimirovich; Kovalev, Gennady Ivanovich; and Mshvenieradze, Alexei Pimenovich. Travelling-wave loom. 4,037,628, Cl. 139-436.000.
Komarova, Nadezhda Andreevna: *See*—
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.
Komatsu Electronic Metals Co., Ltd.: *See*—
Tokimoto, Tadashi; and Hiraishi, Yoshinobu, 4,038,370, Cl. 423-336.000.
Komine, Yoshio: *See*—
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
Kompanek, Harry W. Ultrasonic system for improved combustion, emission control and fuel economy on internal combustion engines. 4,038,348, Cl. 261-36.00A.
Kondo, Hidenobu; and Nakano, Yoshiyuki, to Nippon Kogaku K.K. Interlocking device for a camera. 4,038,672, Cl. 354-212.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, 4,038,081, Cl. 96-66.300.
Kononov, Nikolai Fedorovich: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.
Kopachkov, Slavco A., to Rothmans of Pall Mall Canada Limited. Locking mechanism. 4,037,804, Cl. 242-68.300.
Koppa, Daniel Anthony: *See*—
Griner, Arthur J.; and Koppa, Daniel Anthony, 4,038,007, Cl. 425-259.000.
Griner, Arthur J.; and Koppa, Daniel Anthony, 4,038,016, Cl. 425-451.900.
Koppel, Gary A.; and Nummy, Laurence J., to Eli Lilly and Company. Process for preparation of 3-hydroxymethylcephems. 4,038,275, Cl. 260-243.00C.
Koppers Company, Inc.: *See*—
Cosby, James Lynwood; and Morgret, Gordon Lawrence, 4,038,130, Cl. 156-473.000.
Wright, John, 4,037,430, Cl. 64-9.00R.
Koret, Inc.: *See*—
Gordon, Michael, 4,037,633, Cl. 150-33.000.
Kosowsky, Leo N.: *See*—
Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.
Kost, Walter Robert, to General Mills, Inc. Representative sampling device. 4,037,474, Cl. 73-421.00R.
Koster, Johan Bernhard; Meiners, Hans Joachim; and Moretto, Hans Heinrich, to Bayer Aktiengesellschaft. Process for the production of cold hardening foams containing urethane groups by in-mold foaming. 4,038,221, Cl. 260-2.5AH.
Koumura, Suketsugu: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.
Kovalev, Gennady Ivanovich: *See*—
Komarov, Jury Ivanovich; Titov, Dmitry Vladimirovich; Kovalev, Gennady Ivanovich; and Mshvenieradze, Alexei Pimenovich, 4,037,628, Cl. 139-436.000.
Koyama, Masaharu: *See*—
Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.
Kozlov, Boris Mikhailovich: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.
Kraemer, John F.: *See*—
Traxler, James T.; Lira, Emil Patrick; and Kraemer, John F., 4,038,097, Cl. 106-288.00B.
Kramer, Brian D., to Hercules Incorporated. Photocross-linkable polymers containing pendant diazoester groups. 4,038,253, Cl. 260-47.00R.
Kramer, Doris S. Refrigeration evaporators with ice detectors. 4,037,427, Cl. 62-128.000.
Kramer, Wolfgang: *See*—
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,404, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,406, Cl. 424-269.000.
Krapcho, John; and Schwartz, Joseph, to E. R. Squibb & Sons, Inc. CNS active compounds. 4,038,274, Cl. 260-240.00F.
Kratochvil, Miroslav, to R.M.C. Transport (New South Wales) Pty. Limited. Kilns. 4,038,025, Cl. 432-13.000.
Krauss, Mary A.: *See*—
Trifiletti, Thomas, 4,037,581, Cl. 126-39.00M.
Krehbiel, Robert D.: *See*—
Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., 4,037,410, Cl. 60-445.000.
Kresser, Anton; and Bastein, Jens, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for mixing friction-reducing additive to water. 4,037,618, Cl. 137-266.000.
Kressler, Robert R.: *See*—
Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.
Krisch, Burkhard; Veneklasen, Lee H.; and Willasch, Dieter, to Siemens Aktiengesellschaft. Scanning transmission electron microscope including an improved image detector. 4,038,543, Cl. 250-307.000.
Krishnan, Ram M.: *See*—
White, John R.; Krishnan, Ram M.; and Wolfe, James D., 4,038,088, Cl. 106-38.240.
Kronner, Richard F. Guide pin locating tool and method. 4,037,592, Cl. 128-92.0EB.
Kropiwka, Thomas. Auxiliary shelf apparatus. 4,037,542, Cl. 108-32.000.
Krueger, Earl R.: *See*—
Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., 4,038,415, Cl. 424-317.000.

Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal display screen with multiple electrode arrangement. 4,037,927, Cl. 350-160.0LC.

Kruger, Joachim. Fish lure. 4,037,348, Cl. 43-42.230.

Kruse, James A. Grinding tool. 4,037,367, Cl. 51-209.00S.

Krutz, Wolfgang; and Steinberg, Hans, to Lohmann & Stolterfoht A.G. Lubricating means for the transmission gear of a ship. 4,037,687, Cl. 184-6.400.

Ku, Ta Cheng; and Stiles, Donald Joseph, to International Business Machines Corporation. Cup shaped printer. 4,037,707, Cl. 197-53.000.

Kubota, Shinsaku: *See*—
Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, 4,037,828, Cl. 266-271.000.

Kudinova, Sofya Ivanovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, to Sumitomo Chemical Company, Limited. Process for preparing novel petroleum resin employing $AlRX_2$ and alkyl halide or hydrogen halide. 4,038,474, Cl. 526-185.000.

Kuebler, Glenn M. Bird perch alarm. 4,038,639, Cl. 340-272.000.

Kuehn, Lorne; and Seigel, Harold O., to Canada, Her Majesty the Queen in Right of. Spatial orientation device. 4,037,328, Cl. 33-349.000.

Kuehn, Melvin C., to Ormite, Inc. Synthetic slate. 4,038,242, Cl. 260-39.00R.

Kuhlmann, Robert: *See*—
Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, 4,038,224, Cl. 260-15.00R.

Kuhn, Wolfgang Hermann: *See*—
Baukal, Werner; Knodler, Reinhard; and Kuhn, Wolfgang Hermann, 4,038,464, Cl. 429-104.000.

Kuhnert, Otto: *See*—
Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, 4,038,224, Cl. 260-15.00R.

Kullmann, Dieter, to Siemens Aktiengesellschaft. Current feeding device for electrical apparatus with conductors cooled to a low temperature. 4,038,492, Cl. 174-15.00S.

Kumano, Hiroshi: *See*—
Nishino, Atsushi; Hayakawa, Hayashi; and Kumano, Hiroshi, 4,038,159, Cl. 204-38.00A.

Kumar, Surinder: *See*—
Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,038,437, Cl. 426-656.000.

Kuniyoshi, Masateru: *See*—
Namba, Masanao; Kuniyoshi, Masateru; and Kobayashi, Akira, 4,038,624, Cl. 336-60.000.

Kunkle, Kenneth W., to Pierce America, Inc. Adjustable painting or plating rack. 4,037,727, Cl. 211-117.000.

Kuntz, William H.; and Moore, Donald G., to Chemetron Corporation. Method and apparatus for sensor assembly inspection. 4,037,479, Cl. 73-432.00R.

Kunzle, Othello, to Elex A.G. Quick coupling device. 4,037,863, Cl. 285-320.000.

Kuper, Donald G., to Phillips Petroleum Company. Unsaturated alicyclic carbinols and dicarbinols and method of preparation. 4,038,326, Cl. 260-617.00C.

Kuribayashi, Hideyuki: *See*—
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000.

Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, to Hitachi, Ltd. Vertical type antifriction bearing device. 4,037,890, Cl. 308-187.000.

Kurita, Takaji: *See*—
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.

Kurov, Boris Alexeevich: *See*—
Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.

Kutter, Eberhard: *See*—
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Kuwa, Morihiko: *See*—
Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, 4,038,168, Cl. 204-197.000.

Kuzmich, Valery Konstantinovich; and Dashevsky, Yakov Tevelevich. Balance for determining the weight percentage of an extracted component with respect to the total weight of a test material. 4,037,674, Cl. 177-200.000.

L. Schuler GmbH: *See*—
Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, 4,037,730, Cl. 214-1.0BB.

La Technique Integrale: *See*—
Perrin, Herve, 4,037,893, Cl. 308-205.000.

Labaire, Wallace F. Ear protector. 4,037,273, Cl. 2-209.000.

Laboratoires Laroche Navarron: *See*—
Pinhas, Henri, 4,038,319, Cl. 260-570.700.

Laboratorios del Dr. Esteve, S.A.: *See*—
Esteve-Subirana, Antonio, 4,038,390, Cl. 424-250.000.

Laborie, Jean-Pierre; and Pevrol, Michel, to Societe Nationale Industrielle Aerospatiale. Device for connecting peripheral units to a line for transmitting data by pulse code modulation. 4,038,601, Cl. 325-23.000.

Lacagnina, John M.: *See*—
Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.

Lacy, Garry T.: *See*—
Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.

Ladd, Floyd R.: *See*—
Schulze, Robert R.; and Ladd, Floyd R., 4,037,631, Cl. 141-2.000.

Laegreid, Nils: *See*—
Moss, Ronald W.; McClanahan, Edwin D., Jr.; and Laegreid, Nils, 4,038,171, Cl. 204-298.000.

LaFave, Richard L.; and Probst, Richard O., to Ransburg Corporation. Electrostatic coating apparatus. 4,037,561, Cl. 118-629.000.

Lailach, Gunter, to Bayer Aktiengesellschaft. Reduction of iron in titanium ore. 4,038,364, Cl. 423-86.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Brilloit, Jacques, 4,037,331, Cl. 34-92.000.

Laird, George William, to Boeing Company, The. Flexure having pitch flap coupling. 4,037,988, Cl. 416-141.000.

Laitram Corporation, The: *See*—
Fowler, John T., 4,038,528, Cl. 235-150.260.

Lakiza, Sergei Markovich: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.

Lallement, Bernard, to Vitos Etablissements Vitoux. Method and machine for the production of a serigraphic screen by the photochemical method. 4,037,957, Cl. 355-91.000.

Lam, Charles T. W., to Miles Laboratories, Inc. Test composition, device and method for detecting bilirubin. 4,038,031, Cl. 23-230.00B.

Lamarine, John H.; Stewart, Robert C., Jr.; and Vine, Raymond W., to United Technologies Corporation. Electrode reservoir for a fuel cell. 4,038,463, Cl. 429-44.000.

Lamb, Donald J., to Upjohn Company, The. Medroxyprogesterone acetate compositions. 4,038,389, Cl. 424-243.000.

Lambert, Everette M. Bead forming apparatus and method. 4,038,119, Cl. 156-163.000.

LaMonica, Diana: *See*—
LaMonica, Jeanette; and LaMonica, Diana, 4,037,844, Cl. 273-136.00K.

LaMonica, Jeanette; and LaMonica, Diana. Child's toy tent chess board. 4,037,844, Cl. 273-136.00K.

Land, Edwin H., to Polaroid Corporation. Process comprising diffusion transfer silver image removal. 4,038,077, Cl. 96-29.00R.

Laney, Thomas D., Sr. Handle mechanism for machine tools. 4,037,488, Cl. 74-548.000.

Langbein, Adolf: *See*—
Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.

Langberg, Edwin. Replica bridge sensing circuit. 4,038,609, Cl. 331-65.000.

Langecker, Erhard, to Battenfeld Maschinenfabriken GmbH. Extrusion head. 4,038,017, Cl. 425-466.000.

Langenberg, Werner: *See*—
Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.

Langhorst, Martin A.: *See*—
May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., 4,038,188, Cl. 210-20.000.

Lanz, Donald D.; and Hencye, Ronald E., to Omark Industries, Inc. Method of making integrated tie strap and rivet assemblies for saw chains. 4,037,403, Cl. 59-8.000.

Lanza, Thomas J.: *See*—
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.

Lapham, Sidney D. Universal stem for a carpet caster. 4,037,292, Cl. 16-38.000.

Large, Eugene. Flywheel aided bicycle. 4,037,854, Cl. 280-217.000.

Larkin, John M.: *See*—
Duranleau, Roger G.; and Larkin, John M., 4,038,316, Cl. 260-566.00A.

La Roche, Ulrich, to BBC Brown Boveri & Company Limited. Sewage sludge-irradiation device. 4,038,028, Cl. 21-102.00R.

Larsen, Ronald Leslie, to Conwed Corporation. Production of net or net-like products. 4,038,008, Cl. 425-290.000.

Larsson, Hans Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Method for hydrostatic extrusion. 4,037,305, Cl. 29-421.00R.

Lassen, Niels, to Kefalas A/S. Compositions of and method of treating with the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethyl-piperazino-N)-propylidene]-thiaxanthene, carboxylic acid esters thereof and acid addition salts of these compounds. 4,038,395, Cl. 424-250.000.

Latady, William R. Variable field of view, variable magnification lens assembly for miniature image viewer. 4,037,939, Cl. 350-241.000.

Latron Laboratories, Inc.: *See—*
Nonaka, Urao; Shibata, Hideto; and Nakajima, Nobuyuki, 4,038,146, Cl. 195-103.50R.

Lawrence Peska Associates, Inc.: *See—*
Schweers, William Edwin, 4,037,726, Cl. 211-105.500.

Layman, H. David: *See—*
Minnier, Henry B.; and Layman, H. David, 4,038,205, Cl. 252-301.60S.

LeBell, Gene. Motorvehicle safety cut-out switch. 4,037,683, Cl. 180-99.000.

Le Carvennec, Francois: *See—*
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Ledebur, Harry Calhoon; and Diehl, Floyd William, Jr., to Wean United, Inc. Shell feed system for a cold pilger mill. 4,037,444, Cl. 72-21.000.

Ledwell, Lloy W., Jr. System for harvesting and transporting chickens. 4,037,565, Cl. 119-82.000.

Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., to said Micro Computer Inc. by said Barry T. Lee, Ralph V. Cole, Gunther W. Wimmer. Interactive control system. 4,038,640, Cl. 364-200.000.

Lee, Cyril Arthur, to E M I Limited. Method and apparatus for authenticating a record medium consisting of applying two different strength magnetizing fields and monitoring the remanent fields. 4,038,596, Cl. 324-34.00R.

Lee Inventions, Inc.: *See—*
Lee, William S., 4,037,739, Cl. 214-38.0CC.

Lee, William S., to Lee Inventions, Inc. Moving system with integral casters. 4,037,739, Cl. 214-38.0CC.

Leeds & Northrup Company: *See—*
Weiss, Edward Leonhardt, 4,037,965, Cl. 356-102.000.
Wertheimer, Alan Lee; and Williams, Frederick Lee, 4,037,964, Cl. 356-102.000.

LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Parenteral administration set with internal valve and flow restrictor. 4,037,596, Cl. 128-214.00C.

Leffingwell Chemical Company: *See—*
Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., 4,038,385, Cl. 424-166.000.

Legrand, Paul Joseph, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for mounting a turboreactor on an aeroplane. 4,037,809, Cl. 244-54.000.

Lehmann, G. W. Horst; and Curts, H. A. Julius, to Beiersdorf Aktiengesellschaft. Pressure sensitive adhesive coated sheet material. 4,038,454, Cl. 428-356.000.

Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., to Burroughs Corporation. High speed printing apparatus. 4,037,535, Cl. 101-287.000.

Lehr, Glen J.: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 4,038,105, Cl. 136-231.000.

Lehureau, Jean Claude: *See—*
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Leibach, Heinrich, to Motoren- und Turbinen-Union Munchen GmbH. Gas turbine engine for vehicles. 4,037,409, Cl. 60-413.000.

Leimgruber, Willy: *See—*
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.

Leistiko, Lawrence F.: *See—*
Deitch, James C.; and Leistiko, Lawrence F., 4,037,913, Cl. 339-221.00M.

Lekas, Mitchell A. Process for recovery of carbonaceous materials from subterranean deposits by in situ processing. 4,037,657, Cl. 166-271.000.

Lelgemann, Ludwig: *See—*
Eisele, Wolfgang; Lelgemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, 4,038,229, Cl. 260-29.40R.

LeMay, Christopher Archibald Gordon, to E M I Limited. Circuit for signal data obtained from an axial tomographic scanning apparatus. 4,038,551, Cl. 250-445.00T.

Lemelson, Jerome H. Apparatus for forming ribbed tubing. 4,038,011, Cl. 425-325.000.

Lemont, Harold E.: *See—*
Miller, Robert C.; and Lemont, Harold E., 4,037,751, Cl. 220-9.00R.

Lenk, Erich, to Barmag Barmer Maschinenfabrik. Nozzle plate holder. 4,038,005, Cl. 425-190.000.

Leontiev, Alexandr Semenovich: *See—*
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.

Leshik, Edward Alexander, to Hellermann Cassettes Limited. Player for tape cartridges and cassettes. 4,038,694, Cl. 360-105.000.

Leslie Hartridge Limited: *See—*
Emerson, Reginald Stanley, 4,037,467, Cl. 73-119.00A.
Emerson, Reginald Stanley, 4,037,468, Cl. 73-119.00A.

Lester, Fritz O., to Lester, Liane E. Method for forming table and bench construction. 4,038,126, Cl. 156-290.000.

Lester, Liane E.: *See—*
Lester, Fritz O., 4,038,126, Cl. 156-290.000.

Lever Brothers Company: *See—*
Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, 4,037,294, Cl. 17-56.000.

Levine, Leon: *See—*
Rostoker, Martin; and Levine, Leon, 4,038,264, Cl. 260-79.30M.

Levinson, Donald B.: *See—*
Quinn, Halsey P.; and Levinson, Donald B., 4,038,594, Cl. 323-4.000.

Levy, Richard H.: *See—*
Janes, George Sargent; and Levy, Richard H., 4,038,549, Cl. 250-423.00P.

Lewis, Fielding H., Jr., to W. T. Burnett & Co. Lacrosse stick having tubular metallic handle. 4,037,841, Cl. 273-96.00D.

Lewis, Paul R., to Aluminum Company of America. Tear-off closure and method of forming the same. 4,037,551, Cl. 113-121.00C.

Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, to International Business Machines Corporation. Memory input signal buffer circuit. 4,038,567, Cl. 307-362.000.

Li, Choh Hao, to Hoffman-La Roche Inc. Untriakontapeptide with opiate activity. 4,038,222, Cl. 260-8.000.

Libbey-Owens-Ford Company: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 4,038,105, Cl. 136-231.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Keydel, Wolfgang, 4,037,540, Cl. 102-70.20P.
Kresser, Anton; and Bastein, Jens, 4,037,618, Cl. 137-266.000.
Sieber, Paul, 4,037,402, Cl. 58-85.500.

Lichtenberg, Jose: *See—*
Rojahn, Fred H.; and Lichtenberg, Jose, 4,037,295, Cl. 24-205.13D.

Lie, George K.: *See—*
Charles, Herbert N.; and Lie, George K., 4,037,987, Cl. 416-132.00A.

Lien, Neil C., to Baker Manufacturing Company. Pitless well adapter apparatus. 4,037,654, Cl. 166-88.000.

Lies, Thomas Andrew; and Clapp, James Wellington, to American Cyanamid Company. Dithiocarbamate ester bactericides and fungicides. 4,038,288, Cl. 260-329.00S.

Liggett Group Inc.: *See—*
Hall, Floyd Vanmeda, 4,037,524, Cl. 93-77.0FT.

Lillie, Christian: *See—*
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Lin, Paul T., to Cambridge Memories, Inc. Multilayer ceramic multichip, dual in-line packaging assembly. 4,038,488, Cl. 174-52.0FP.

Linbro Scientific, Inc.: *See—*
Liner, John; and Soderberg, Eric W., 4,038,149, Cl. 195-127.000.

Lincoln Manufacturing Company, Inc.: *See—*
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,037,896, Cl. 312-281.000.

Lind, Hanns, to Ciba-Geigy Corporation. Light protecting agents. 4,038,250, Cl. 260-45.85B.

Lindblad, Sture, to Stiga AB. Grass ejection system for motor-driven lawn mowers. 4,037,394, Cl. 56-202.000.

Linden-Alimak AB: *See—*
Thorsell, Torgny; and Svensson, Torbjorn, 4,037,537, Cl. 102-22.00R.

Liner, John; and Soderberg, Eric W., to Linbro Scientific, Inc. Laboratory trays with lockable covers. 4,038,149, Cl. 195-127.000.

Linforth, William J.: *See—*
Doe, Ewart H.; and Linforth, William J., 4,037,733, Cl. 214-1.500.

Linning, David Lees; and Dodd, John Alan, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel elements. 4,038,138, Cl. 176-81.000.

Lipani, Anthony F., to Xerox Corporation. Process for producing electrostatographic prints. 4,038,076, Cl. 96-1.0SD.

Lipe-Rollway Corporation: *See—*
Brutcher, Donald W., 4,037,710, Cl. 198-443.000.

Lippold, Hans-Martin; and Spahrbier, Dieter, to Varta Batterie Aktiengesellschaft. Galvanic cell. 4,038,467, Cl. 429-219.000.

Lira, Emil Patrick: *See—*
Traxler, James T.; Lira, Emil Patrick; and Kraemer, John F., 4,038,097, Cl. 106-288.00B.

Litton Industrial Products, Inc.: *See—*
Hellenkamp, Johann F., 4,038,571, Cl. 310-8.200.

Litton Systems, Inc.: *See—*
Reynolds, Richard L., 4,037,281, Cl. 10-10.00R.

Litwin, Hans: *See—*
Steinhauser, Erwin; and Litwin, Hans, 4,038,444, Cl. 427-261.000.

Lliteras, Juan Andres. High torque fastener head. 4,037,514, Cl. 85-45.000.

Lo, Allen Kwok Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Camera for taking stereoscopic pictures. 4,037,950, Cl. 352-58.000.

Loctite Corporation: *See—*
Frauenglass, Elliott; and Werber, Gerhardt P., 4,038,475, Cl. 526-328.000.

Loctite (Ireland), Limited: *See—*
O'Sullivan, Denis J.; and Bolger, Bernard J., 4,038,345, Cl. 260-881.000.

Loe, Alton L., Jr., to Weyerhaeuser Company. Process control apparatus for controlling a particleboard manufacturing system. 4,038,531, Cl. 235-151.100.

Lohmann & Stolterfoht A.G.: *See—*
Krutz, Wolfgang; and Steinberg, Hans, 4,037,687, Cl. 184-6.400.

Lohse, Friedrich: *See—*
Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.

Loliger, Willi, to Alpura Koreco A.G. Volumetric pump. 4,037,996, Cl. 417-518.000.

Lonsmin, Victor. Novelty writing instrument having an appearing and disappearing personal name. 4,037,343, Cl. 40-334.000.

Looney, John Howard, to Xerox Corporation. Sorter apparatus. 4,037,832, Cl. 271-173.000.

Lopatinsky, Vadim Petrovich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Loran, Thomas J.; Friebel, Virgil R.; and Pardee, Robert P., to Ball Brothers Research Corporation. Leader strip for motion picture film. 4,038,453, Cl. 428-325.000.

Lorang, Walter R. Golf swing training apparatus. 4,037,847, Cl. 273-187.00B.

Lorenz, Michael. Children's lamp. 4,038,561, Cl. 307-141.000.

Loui, Phillip J.; and Schmidt, James A., Jr., to Handy Button Machine Company. Shelf support. 4,037,813, Cl. 248-250.000.

Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., to National Plastics & Plating Supply. Indexing system. 4,038,169, Cl. 204-202.000.

Lovgren, Anders, to UTEC AB. Method of manufacturing doors and arrangement therefor. 4,037,301, Cl. 29-429.000.

Lowe, Richard L. Seatless valve. 4,037,820, Cl. 251-310.000.

Lowther, Frank Eugene, to W. R. Grace & Co. Electrical sensing and regenerating system for molecular sieve driers. 4,038,050, Cl. 55-18.000.

Lowther, Frank Eugene, to Union Carbide Corporation. Corona reaction method. 4,038,165, Cl. 204-176.000.

Lu, Sun: *See—*
Jones, Derick; and Lu, Sun, 4,038,199, Cl. 252-299.000.
Jones, Derick; and Lu, Sun, 4,038,200, Cl. 252-299.000.

Lucas, James F., to Ideal Industries, Inc. No-strip electrical connector. 4,037,905, Cl. 339-98.000.

Luceyk, Alfred Robert; Mouwen, Herman Charles; and Weinberg, Steven Louis, to Johnson & Johnson; and Purolator, Inc. Blood filter unit. 4,038,194, Cl. 210-436.000.

Luckerath, Klaus: *See—*
Giessler, Horst; and Luckerath, Klaus, 4,037,541, Cl. 104-109.000.

Ludwig, Frank A.; and Weiner, Steven A., to Ford Motor Company. Sodium sulfur battery or cell with external storage. 4,038,465, Cl. 429-104.000.

Lueders, Robert E.: *See—*
Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., 4,038,298, Cl. 260-429.00J.

Lum, Sam: *See—*
Miller, Gerald K.; and Lum, Sam, 4,038,490, Cl. 174-88.00C.

Luoma, Eino J.: *See—*
Connolly, Thomas M.; and Luoma, Eino J., 4,038,660, Cl. 343-18.00A.

Lussling, Theodor: *See—*
Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, 4,038,276, Cl. 260-248.00C.

Luthringer, Jean: *See—*
Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.

Lutz, Kurt; and Ulmer, Eugen. Apparatus for discontinuously applying fluid to a strand-like material. 4,037,560, Cl. 118-314.000.

Luzzi, John J.: *See—*
Spivack, John D.; and Luzzi, John J., 4,038,249, Cl. 260-45.75R.

Lynn, John R.: *See—*
Tate, George W., Jr., 4,037,593, Cl. 128-146.200.

Lyon, LaVerne D.: *See—*
November, Milton H.; and Lyon, LaVerne D., 4,037,460, Cl. 73-32.00A.

Maaghul, John, to PPG Industries, Inc. Glass fiber sizing compositions for the reinforcement of resin matrices. 4,038,243, Cl. 260-40.00R.

Macander, Rudy F.: *See—*
Brindell, Gordon D.; and Macander, Rudy F., 4,038,327, Cl. 260-619.00R.

Macemon, James H., to Baxter Travenol Laboratories, Inc. Digitally settable selective control for speed of wavelength scan or for time base scan. 4,037,960, Cl. 356-73.000.

Macemon, James H., to Baxter Travenol Laboratories, Inc. System and apparatus for contour plotting the total luminescence spectrum of a sample. 4,037,961, Cl. 356-85.000.

Mach III, Inc.: *See—*
Sammis, George L., 4,038,123, Cl. 156-240.000.

Maciey, James L.: *See—*
Dersch, James E.; and Maciey, James L., 4,037,578, Cl. 123-179.0BG.

MacLean, John P.: *See—*
Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.

Madern, Jean-Pierre. Combination solar and electric heater. 4,037,785, Cl. 237-1.00A.

Madison, Victor J.: *See—*
Hillyer, Michael J.; and Madison, Victor J., 4,038,573, Cl. 310-71.000.

Maehara, Toshifumi, to Akebono Brake Industry Company, Ltd. Audible alarm sounding type pad clip device for disc brake. 4,037,689, Cl. 188-1.00A.

Maekawa, Yosuke: *See—*
Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.

Magerkurth, Bernhard: *See—*
Eisele, Wolfgang; Leigemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, 4,038,229, Cl. 260-29.40R.

Magerlein, Barney J., to Upjohn Company, The. O-Glycoside ortho esters of neamine containing compounds. 4,038,478, Cl. 536-17.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,037,885, Cl. 308-3.800.

Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D. Multi-story floor-ceiling system and method. 4,037,375, Cl. 52-220.000.

Magill, Stephen E.: *See—*
Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., 4,037,594, Cl. 128-142.300.

Magnetic Controls Company: *See—*
Deitch, James C.; and Leistiko, Lawrence F., 4,037,913, Cl. 339-221.00M.

Maier, Joseph: *See—*
Jaworek, Dieter; Maier, Joseph; and Nelbock-Hochstetter, Michael, 4,038,140, Cl. 195-63.000.

Maines, James K.: *See—*
Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., 4,038,436, Cl. 426-603.000.

Maitra, Sisir Kumar, to Alfred Gutmann Gesellschaft fur Maschinenbau. Method of cooling recovered sand for casting purposes and apparatus therefor. 4,037,648, Cl. 165-13.000.

Makino, Shigeo: *See—*
Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.

Mallonen, Edward A.: *See—*
Oakland, Frederic; and Mallonen, Edward A., 4,038,619, Cl. 335-61.000.

Maloof, Robert E., to Victor Electric Wire & Cable Corporation. Method of manufacture of male electrical plug assembly. 4,037,319, Cl. 29-629.000.

Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, to Snam Progetti S.p.A. Process for isomerizing alkenes. 4,038,337, Cl. 260-683.200.

Mandler, Walter: *See—*
Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.

Mandrin, Charles: *See—*
Ergenc, Mehmet Sahabettin; and Mandrin, Charles, 4,038,035, Cl. 23-260.000.

Mann, Byron C.: *See—*
Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., 4,038,626, Cl. 337-4.000.

Mannesmannrohren-Werke AG: *See—*
Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, 4,038,550, Cl. 250-358.00P.

Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,038,215, Cl. 252-465.000.

Manser, Josef; and Egger, Friedrich, to Gebrueder Buehler AG. Method for processing soft vegetable foodstuffs into crumbs. 4,038,433, Cl. 426-615.000.

Mapelsden, George C., to General Electric Company. Electrical switch method operating such and indexing system. 4,038,508, Cl. 200-329.000.

Maples, Lea. Adjustable end pin for string bass or cello. 4,037,505, Cl. 84-280.000.

Marburger, Heinz: *See—*
Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.

Marchant, Kerford A., Jr.; and Fenoglio, David J., to Standard Oil Company (Indiana). Azo-bisanhydride of trimellitic anhydride. 4,038,266, Cl. 260-152.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Clamshell guide to apply annular elastic bands on clothes. 4,037,547, Cl. 112-121.270.

Marin, Gilbert, to Rhone-Poulenc Industries. Dismutation of trichlorosilane. 4,038,371, Cl. 423-342.000.

Mariner, Charlie Dwain: *See—*
Shlesinger, B. Edward, Jr.; and Mariner, Charlie Dwain, 4,038,620, Cl. 335-153.000.

Marion Laboratories, Inc.: *See—*
Miller, Lowell Donald; Hounsell, Melvin Wayne; and Spinner, Ernest Elliott, 4,038,148, Cl. 195-127.000.

Marion Power Shovel Company, Inc.: *See—*
Sankey, Edwin W., 4,037,894, Cl. 308-227.000.

Marker, Hannes. Apparatus for connecting a sailing mast to a sailing board. 4,037,553, Cl. 114-91.000.

Marks, John D. Card key and/or coin holder. 4,037,716, Cl. 206-38.000.

Marlowe, Mickey O.: *See—*
Noble, Lowell A.; Grossman, Leonard N.; and Marlowe, Mickey O., 4,038,117, Cl. 156-2.000.

Marr, George; and Smith, George Elwood, to Burroughs Corporation;

and Bell Telephone Laboratories Incorporated. Method for making transistor structures. 4,038,107, Cl. 148-1.500.
Marsden, James Glenn; and Orenski, Peter Joseph, to Union Carbide Corporation. Azido-silane compositions. 4,038,456, Cl. 428-391.000.
Marson Corporation: *See*—
Di Maio, Anthony E.; Bresnahan, Alfred E.; and Todisco, Joseph G., 4,037,448, Cl. 72-114.000.
Martan, Michael; and Reichenbacher, Paul H., to UOP Inc. Isomerization of cis-anethole to trans-anethole. 4,038,325, Cl. 260-612.00D.
Martin, Donald P.; and Ryan, Richard G., to Extel Corporation. Descender printing system for dot matrix printer. 4,037,705, Cl. 197-1.00R.
Martin, Randel C.: *See*—
Stevens, James E.; and Martin, Randel C., 4,037,737, Cl. 211-106.000.
Martin, Thom O., to General Foods Corporation. Process for preparing a dried agglomerated cereal mixture. 4,038,427, Cl. 426-285.000.
Martinen, Hinrich: *See*—
Schultz, Peter; and Martinen, Hinrich, 4,037,724, Cl. 209-111.70R.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D., 4,037,842, Cl. 273-127.00R.
Marx, Michael: *See*—
Walker, Keith A. M.; and Marx, Michael, 4,038,409, Cl. 424-273.000.
Maschinenfabrik Koppern GmbH & Co., KG: *See*—
Rieschel, Hartmut, 4,037,303, Cl. 29-420.500.
Mashkovsky, Mikhail Davidovich: *See*—
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.
Massachusetts Institute of Technology: *See*—
Henrich, Victor E.; and Fan, John C. C., 4,038,216, Cl. 252-514.000.
Melcher, James R.; Sachar, Kenneth S.; and Zahedi, Karim, 4,038,049, Cl. 55-2.000.
Melcher, James R.; and Johnson, Thomas W., 4,038,052, Cl. 55-138.000.
Massey-Ferguson Inc.: *See*—
Reuter, Floyd W., 4,037,755, Cl. 221-211.000.
Masso Remiro, Jose Maria, to Turbo, S.A. Woman's correcting garment. 4,037,606, Cl. 128-547.000.
Mastis, Victor: *See*—
Klimek, Boleslaw M.; and Mastis, Victor, 4,037,907, Cl. 339-126.00R.
Masu, Masanobu: *See*—
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.
Mathijssen, Petrus Johannes, to U.S. Philips Corporation. Short-arc discharge lamp with electrode support structure. 4,038,578, Cl. 313-217.000.
Matsubara, Masaki, to Olympus Optical Co., Ltd. Microscope objective. 4,037,934, Cl. 350-175.0ML.
Matsubayashi, Yukio: *See*—
Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, 4,038,452, Cl. 428-224.000.
Matsumoto, Saburo: *See*—
Arakawa, Yoshiaki; Aoyanagi, Isamu; and Matsumoto, Saburo, 4,037,463, Cl. 73-341.000.
Matsumoto, Seiji, to Rank Xerox Ltd. Apparatus for liquid development of cut sheet electrostatographic copies. 4,037,952, Cl. 355-3.00P.
Matsumoto, Seiji: *See*—
Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
Matsuo, Tadashige: *See*—
Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, 4,038,214, Cl. 252-458.000.
Matsushita Electric Corporation of America: *See*—
Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,038,689, Cl. 358-191.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kato, Makoto, 4,037,918, Cl. 350-3.500.
Kinugasa, Terukazu; and Hirohata, Hyogo, 4,038,457, Cl. 428-411.000.
Nishino, Atsushi; Hayakawa, Hayashi; and Kumano, Hiroshi, 4,038,159, Cl. 204-38.00A.
Sekido, Satoshi; and Arita, Tomohiko, 4,038,586, Cl. 361-435.000.
Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, 4,037,933, Cl. 350-161.00W.
Matsuura, Yoshihiko: *See*—
Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, 4,037,548, Cl. 112-123.00R.
Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, to Hitachi, Ltd. Liquid crystal display cells. 4,037,930, Cl. 350-160.0LC.
Matthews, Russell Byron, to Johnson Controls, Inc. Fail-safe energizing circuit for a functional device. 4,038,019, Cl. 431-51.000.
Mattson, Larry Frederick: *See*—
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, 4,038,693, Cl. 360-99.000.
Maughan, William G., to Westvaco Corporation. Handhole closure for containers. 4,037,777, Cl. 229-52.00B.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v.: *See*—
Wagner, Christoph, 4,037,480, Cl. 73-432.00R.
May, Douglas H., Jr.: *See*—
Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.
May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., to Dow Chemical Company, The. Method for preventing eutectic caking of sodium chloride at high temperatures. 4,038,188, Cl. 210-20.000.
May, Klaus D.; and Nasuta, Anthony T., Jr., to United States of America, Air Force. Pulse peak sample and hold circuit. 4,038,568, Cl. 307-351.000.
May, Louis, to Sate-lite Mfg. Co. Retroreflective marker devices for attachment to spokes of bicycle wheels or the like. 4,037,924, Cl. 350-97.000.
McAnulty, James C.; and McCarthy, Edwin B., to A.C. Nielsen Company. Rotary, printed circuit wafer switch and method for adjusting. 4,038,504, Cl. 200-11.0DA.
McCall, Gene H.: *See*—
Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., 4,038,125, Cl. 156-280.000.
McCarthy, Edwin B.: *See*—
McAnulty, James C.; and McCarthy, Edwin B., 4,038,504, Cl. 200-11.0DA.
McClanahan, Edwin D., Jr.: *See*—
Moss, Ronald W.; McClanahan, Edwin D., Jr.; and Laegreid, Nils, 4,038,171, Cl. 204-298.000.
McClure, James D.; and Brandenberger, Stanley G., to Shell Oil Company. Hydrocarbon conversion process using a supported perfluorinated polymer catalyst. 4,038,213, Cl. 252-430.000.
McCoy, John J.; and Zajacek, John G., to Atlantic Richfield Company. Process for the recovery of selenium from urethanes containing selenium or compounds thereof. 4,038,376, Cl. 423-510.000.
McCrabb, James. Grain sampling probe. 4,037,476, Cl. 73-423.00R.
McCrae, James McGeachie: *See*—
Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, 4,038,241, Cl. 260-39.00P.
McCullagh, Ralph J. Radiation shielding apparatus. 4,038,553, Cl. 250-517.000.
McCune, Walter W. Mini tennis table. 4,037,838, Cl. 273-30.000.
McDaniel, John E.; and Morris, Harold B., to Glasrock Products, Inc. Writing nib structure and method of manufacture. 4,037,976, Cl. 401-198.000.
McDonald, Raymond F., to J. I. Case Company. Sweeper assembly. 4,037,284, Cl. 15-83.000.
McDonnell Douglas Corporation: *See*—
Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., 4,038,151, Cl. 195-127.000.
Zuleeg, Rainer; and Notthoff, Johannes K., 4,038,563, Cl. 307-205.000.
McFarland, Douglas F. Speed responsive fluid coupling and clutch. 4,037,692, Cl. 192-3.310.
McGann, Laurence: *See*—
Osheroff, Gene W.; and McGann, Laurence, 4,037,622, Cl. 137-597.000.
McGill, Robert S., III: *See*—
Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., 4,038,061, Cl. 62-126.000.
McGraw, Thomas F. Miniature digital communicator capable of displaying a series of alpha-numeric characters. 4,038,651, Cl. 340-336.000.
McGurk, Joseph. Battery jumper cable carrier. 4,037,720, Cl. 206-328.000.
McIntosh Laboratory, Inc.: *See*—
Evans, Ronald C., 4,038,566, Cl. 307-229.000.
McKeen, Earl S., Jr. Verified mail system. 4,037,956, Cl. 355-77.000.
McLaughlin, Patricia Ann: *See*—
Stapleton, Earl Wesley; McLaughlin, Patricia Ann; and Turnbaugh, Jerry Edwin, 4,037,315, Cl. 29-612.000.
McLeod, Donald Patterson, to Dowty Hydraulic Units Limited. Noise reduction. 4,037,521, Cl. 91-499.000.
McQuay-Perfex Inc.: *See*—
Osheroff, Gene W.; and McGann, Laurence, 4,037,622, Cl. 137-597.000.
McReynolds, William U., to McReynolds, William U. Ocular surgical system. 4,037,589, Cl. 128-20.000.
Mead Johnson & Company: *See*—
Devlin, Richard G., 4,038,145, Cl. 195-103.50R.
Mearl Corporation, The: *See*—
DeLuca, Carmine V., Jr.; Miller, Harold A.; and Waitkins, George R., 4,038,099, Cl. 106-291.000.
Mechanex Corporation, The: *See*—
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., 4,037,848, Cl. 277-37.000.
Thumm, Herbert H., 4,037,849, Cl. 277-37.000.
Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, to AGFA-Gevaert Aktiengesellschaft. Process for the regeneration of photographic bleach-fix baths. 4,038,079, Cl. 96-60.0BF.
Medearis, G. P.; Williams, Sam F., Jr.; and Medearis, Morris O. Rearview mirror for vehicles. 4,037,286, Cl. 15-250.050.
Medearis, Morris O.: *See*—
Medearis, G. P.; Williams, Sam F., Jr.; and Medearis, Morris O., 4,037,286, Cl. 15-250.050.
Mediplast AB: *See*—
Wenander, Bjorn, 4,037,464, Cl. 73-61.400.
Medlin, Eric G.; Blair, Stephen A.; and Dennis, Richard H., to U-Haul International, Inc. Lateral force limiting coupler assembly. 4,037,856, Cl. 280-446.00B.

Medney, Jonas. Expansion joint. 4,037,861, Cl. 285-168.000.
Mehta, John Dorab: *See—*
Benson, Nigel Colin; and Mehta, John Dorab, 4,038,121, Cl. 156-157.000.
Mehta, Rustam; and Dreyer, Stephen F., to Intel Corporation. Dynamic MOS RAM. 4,038,646, Cl. 340-173.00R.
Meiners, Hans Joachim: *See—*
Koster, Johan Bernhard; Meiners, Hans Joachim; and Moretto, Hans Heinrich, 4,038,221, Cl. 260-2.5AH.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 4,038,404, Cl. 424-269.000.
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 4,038,406, Cl. 424-269.000.
Meissner, Herman P.; and Schora, Frank C., to Institute of Gas Technology. High-temperature thermal exchange process. 4,037,653, Cl. 165-1.000.
Melcher, James R.; Sachar, Kenneth S.; and Zahedi, Karim, to Massachusetts Institute of Technology. Electrofluidized beds for collection of particulate. 4,038,049, Cl. 55-2.000.
Melcher, James R.; and Johnson, Thomas W., to Massachusetts Institute of Technology. Apparatus for electrical support and stabilization of static, packed, and fluidized beds. 4,038,052, Cl. 55-138.000.
Melliger, Guido W., to Dierks & Sohne. Granulation apparatus. 4,037,794, Cl. 241-46.170.
Mendelsohn, Lewis Isaac: *See—*
O'Handley, Robert Charles; Nesbitt, Ethan Allen; and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.
Mendy, Francois; Delage, Michel; and Teissier, Jean, to Roussel-UCLAF. Nonalcoholic beverage. 4,038,421, Cl. 426-72.000.
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, to Boehringer Ingelheim GmbH. 1-Hydroxy-1-[(4'-hydroxy-3'aminosulfonamido)-phenyl]-2-amino-ethanes and salts. 4,038,314, Cl. 260-556.00N.
Mentrup, Anton: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.
Merchant Inventors International Limited: *See—*
Owensmith, Alan Sidney Lewis, 4,037,340, Cl. 40-129.00A.
Merck & Co., Inc.: *See—*
Hirschmann, Ralph F.; and Veber, Daniel F., 4,038,282, Cl. 260-295.00D.
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 4,038,306, Cl. 260-479.00S.
Saari, Walfred S., 4,038,411, Cl. 424-274.000.
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.
Merkl, George G. Aluminum halohydrate. 4,038,373, Cl. 423-462.000.
Merrill, Richard C.: *See—*
Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., 4,037,298, Cl. 29-25.420.
Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing an N-[(methoxymethyl-furyl)-methyl]-6,7-benzomorphan and method of use. 4,038,397, Cl. 424-260.000.
Messer, Mayer Naoum: *See—*
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Nagl, Werner, 4,038,040, Cl. 428-596.000.
Metacon AG: *See—*
Ruckstuhl, Franz, 4,037,762, Cl. 222-591.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.
Meyer, Horst: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,038,399, Cl. 424-266.000.
Meyer, Jeffry R.; and Billings, John S., Jr., to Westinghouse Electric Corporation. Supporting insulator assembly for gas-insulated equipment. 4,038,486, Cl. 174-28.000.
Meyer, Richard D., to Phillips Petroleum Company. Filament liquid quenching apparatus. 4,037,288, Cl. 15-302.000.
Meyers, George Leroy; and Pawlowski, Thomas Dominic, to American Can Company. Circular lid. 4,037,776, Cl. 229-43.000.
Meyers, Wheeler W., to Corning Glass Works. Guide roller assembly. 4,037,769, Cl. 226-190.000.
Michaud, Andre; and Chalus, Bernard, to Transac - Compagnie Pour le Developpment des Transactions Automatiques. Blocking device for card or voucher readers designed for public use. 4,037,703, Cl. 194-97.00R.
Michelin Recherche et Technique: *See—*
Hagenbohmer, Bodo; and Schaefer, Philipp, 4,037,636, Cl. 152-347.000.
Mickley, Thomas B. Humidifying apparatus. 4,038,347, Cl. 261-30.000.
Midcalf, Christopher: *See—*
Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, 4,038,241, Cl. 260-39.00P.
Mihatsch, Hansjorg: *See—*
Ashauer, Karl; and Mihatsch, Hansjorg, 4,037,492, Cl. 74-710.000.
Mikhlina, Eva Evseevna: *See—*
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.
Miles Laboratories, Inc.: *See—*
Johnston, Katharine Gentry; and Greyson, Jerome, 4,038,485, Cl. 23-230.00B.
Lam, Charles T. W., 4,038,031, Cl. 23-230.00B.
Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., to Merck & Co., Inc. N-t-butoxycarbonyl-S-lower alkanoylamidomethyl-cysteine and p-nitrophenyl esters. 4,038,306, Cl. 260-479.00S.
Mill & Mix Company, Inc.: *See—*
Stevens, Harold E., deceased, 4,037,797, Cl. 241-100.000.
Miller, Charles Eveleigh, to International Telephone and Telegraph Corporation. Probe and method of making the same. 4,037,461, Cl. 73-32.00A.
Miller Electric Manufacturing Company: *See—*
Risberg, Robet L., 4,038,515, Cl. 219-131.00R.
Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., to FMC Corporation. Digital serial transmitter/receiver module. 4,038,494, Cl. 178-69.100.
Miller, Gerald K.; and Lum, Sam, to United States of America, Navy. Water-seal splice for coaxial cables and method of making same. 4,038,490, Cl. 174-88.00C.
Miller, Harold A.: *See—*
DeLuca, Carmine V., Jr.; Miller, Harold A.; and Waitkins, George R., 4,038,099, Cl. 106-291.000.
Miller, Lowell Donald; Hounsell, Melvin Wayne; and Spinner, Ernest Elliott, to Marion Laboratories, Inc. Anaerobic environmental system for bacteria culture testing. 4,038,148, Cl. 195-127.000.
Miller, Peter B., to Milschar Manufacturing & Development. Locking device. 4,037,438, Cl. 70-18.000.
Miller, Robert C.; and Lemont, Harold E., to Summa Corporation. Insulation system. 4,037,751, Cl. 220-9.00R.
Miller, Sheldon M., to Tesco Engineering Company. Hermaphroditic multiple connector plug. 4,037,902, Cl. 339-49.00R.
Miller, Wayne Russell; Seipp, Jan Viles; and Penfold Garn Farley, to Deere & Company. Hydraulic system. 4,037,519, Cl. 91-1.000.
Mills, Gary E.: *See—*
Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., 4,037,826, Cl. 259-8.000.
Mills, Richard L.: *See—*
Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.
Milom, Joseph. Apparatus for indicating the output of a machine. 4,038,617, Cl. 324-179.000.
Milschar Manufacturing & Development: *See—*
Miller, Peter B., 4,037,438, Cl. 70-18.000.
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich. Method of preparing benzene and methylbenzenes. 4,038,335, Cl. 260-672.00T.
Minegishi, Yutaka; and Arai, Haruhiko, to Kao Soap Co., Ltd. Softening agent for woven fabrics. 4,038,196, Cl. 252-8.800.
Minnesota Mining and Manufacturing Company: *See—*
Fisch, Richard S.; and Newman, Norman, 4,038,080, Cl. 96-60.0BF.
Smith, Carl Mayn; and Tiers, George V. D., 4,038,293, Cl. 260-378.000.
Minnier, Henry B.; and Layman, H. David, to GTE Sylvania Incorporated. Method for producing cadmium free green emitting cathodoluminescent phosphor. 4,038,205, Cl. 252-301.60S.
Minolta Camera Kabushiki Kaisha: *See—*
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
Minoura, Kazuo, to Canon Kabushiki Kaisha. Variable magnification lens system using symmetric lens of variable focal length. 4,037,937, Cl. 350-184.000.
Mirdadian, Mohammad Kian. Methods and systems for use with pulse train circuitry. 4,038,534, Cl. 235-151.340.
Mirjanic, Milorad, to Daimler-Benz Aktiengesellschaft. Construction of separating surfaces of a split bearing. 4,037,888, Cl. 308-74.000.
Mishin, Georgy Yakovlevich: *See—*
Kolobnev, Ivan Filippovich; and Mishin, Georgy Yakovlevich, 4,038,072, Cl. 75-142.000.
Miskiewicz, Leonard A. Rotary-type air filter assembly. 4,038,058, Cl. 55-317.000.
Mitchell, Douglas F.: *See—*
Rapoport, Sidney L.; and Mitchell, Douglas F., 4,037,533, Cl. 101-211.000.
Mitchell, Edward: *See—*
Koenst, John W., Jr.; and Mitchell, Edward, 4,038,351, Cl. 264-45.100.
Mitchell, John D.; and Jordan, Bertram L., to Harrington Manufacturing Company. Leaf guide means for tobacco harvester. 4,037,391, Cl. 56-27.500.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.
Atsukawa, Masumi; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,368, Cl. 423-235.000.
Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, 4,038,214, Cl. 252-458.000.
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, to Dow

Chemical Company, The. 1,3-Dithiolo(4,5-b)pyrazin-2-ylidenepropanedinitrile 4-oxide. 4,038,393, Cl. 424-250.000.

Miyahara, Masahiro; and Suzuki, Hideo, to Oki Electric Industry Company, Ltd. Hybrid computer for displaying sound rays of a sonar system. 4,038,530, Cl. 235-150.530.

Miyake, Hideo: *See—*
Suzuki, Hajime; and Miyake, Hideo, 4,038,257, Cl. 260-75.0NK.

Miyamoto, Seiji, to Sanyo Electric Co., Ltd. Signal detection circuit. 4,038,684, Cl. 358-27.000.

Mizuno, Yukio; and Hiramoto, Midori, to Fuji Jukogyo Kabushiki Kaisha. Exhaust gas purification system for internal combustion engines. 4,037,407, Cl. 60-277.000.

Mo Och Domsjo: *See—*
Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erick, 4,038,102, Cl. 106-316.000.

Mobil Oil Corporation: *See—*
Cooper, James E., 4,037,656, Cl. 166-270.000.
Davidtz, John C., 4,038,183, Cl. 210-47.000.

Mock, Kenneth John; and Mozic, Joseph Daniel, to United States of America, Navy. Method and apparatus for measuring high energy laser beam power. 4,037,470, Cl. 73-190.0EW.

Moench, Theodor Peter: *See—*
Hanstein, Friedrich; and Moench, Theodor Peter, 4,038,360, Cl. 264-293.000.

Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., to Ford Motor Company. Nodularizing treatment employing unitized modifying agent. 4,037,643, Cl. 164-58.000.

Moisiuk, David. Electric stippling device. 4,037,283, Cl. 15-4.000.

Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, to Henkel & Cie G.m.b.H. Process of skin treating with compositions containing polyhydroxyalkylamines. 4,038,418, Cl. 424-358.000.

Molyneux, Godfrey Matthew Owen. Anchorage assemblies. 4,037,384, Cl. 52-698.000.

Momiyama, Kikuo, to Canon Kabushiki Kaisha. High-speed adjustable focus telephoto objective lens. 4,037,935, Cl. 350-176.000.

Monks, Reginald; and Thomas, Idris Lewis, to Radiochemical Centre, Limited, The. Selenium labelled compounds in the saturation analysis of cyclic nucleotide. 4,038,033, Cl. 23-230.300.

Monnier, Michel Jean-Claude: *See—*
Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, 4,038,576, Cl. 313-101.000.

Monroe, Henry T.; and Peebles, William H., Jr. Jumping toy. 4,037,357, Cl. 46-129.000.

Monsanto Company: *See—*
King, David P.; and Barker, Robert I., 4,037,968, Cl. 356-160.000.

Montclair Research Corporation: *See—*
Grossman, Harold, 4,037,607, Cl. 131-10.00R.

Moody, Isaac N., to Industrial & Marine Services (Scotland) Limited. Oil stove. 4,037,582, Cl. 126-116.00R.

Moore, David James: *See—*
Eccles, Edward Stuart; and Moore, David James, 4,038,526, Cl. 235-150.100.

Moore, Donald G.: *See—*
Kuntz, William H.; and Moore, Donald G., 4,037,479, Cl. 73-432.00R.

Moppet, Charles E.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.

Morel, Henri, to ITW de France, S.A. Mechanical devices and means for rotating a shaft. 4,037,489, Cl. 74-548.000.

Moretto, Hans Heinrich: *See—*
Koster, Johan Bernhard; Meiners, Hans Joachim; and Moretto, Hans Heinrich, 4,038,221, Cl. 260-2.5AH.

Morgan Construction Company: *See—*
Gilvar, Martin, 4,037,450, Cl. 72-237.000.

Morgan, Harry: *See—*
Washall, Thomas A.; and Morgan, Harry, 4,038,377, Cl. 423-510.000.

Morge, Michael P., to Caterpillar Tractor Co. Hinge and panel mounting means. 4,037,293, Cl. 16-171.000.

Morgret, Gordon Lawrence: *See—*
Cosby, James Lynwood; and Morgret, Gordon Lawrence, 4,038,130, Cl. 156-473.000.

Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, to Chugai Seiyaku Kabushiki Kaisha. Pharmaceutical composition and method of the use thereof. 4,038,416, Cl. 424-324.000.

Mori, Yoshio: *See—*
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Morimatsu, Hideharu: *See—*
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.

Morin, Edmond A.: *See—*
Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., 4,038,298, Cl. 260-429.00J.

Moritz, Karl Ludwig; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Process for preparing azo dyestuffs containing 2,4,6-triamino-3-(cyano ester or carbonamide)pyridine. 4,038,268, Cl. 260-156.000.

Morrell, Albert Maxwell; and Irlbeck, Dennis Henry, to RCA Corporation. Correcting lens having two effective surfaces. 4,037,936, Cl. 350-189.000.

Morrell, T. Herbert: *See—*
Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.

Morris, Harold B.: *See—*
McDaniel, John E.; and Morris, Harold B., 4,037,976, Cl. 401-198.000.

Morse, Milton. Derailleur construction having fixed increment means. 4,037,484, Cl. 74-217.00B.

Mortikov, Evgeny Sergeevich: *See—*
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.

Morton, Richard F.; and Hale, David F. Dining table combined with food warming apparatus. 4,038,518, Cl. 219-218.000.

Mosca, Rudolph. Emergency kit for vehicle tires. 4,037,638, Cl. 152-415.000.

Moshier, Stephen L., to Dialog Systems, Inc. Speech recognition apparatus. 4,038,503, Cl. 179-1.0SA.

Moskovsky, Alexandr Antonovich: *See—*
Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Moss, Ronald W.; McClanahan, Edwin D., Jr.; and Laegreid, Nils, to Battelle Memorial Institute. Supported plasma sputtering apparatus for high deposition rate over large area. 4,038,171, Cl. 204-298.000.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Leibach, Heinrich, 4,037,409, Cl. 60-413.000.

Motorola, Inc.: *See—*
Ambruoso, Pasquale, Sr.; and Szalvay, Laszlo, 4,038,502, Cl. 179-179.000.
Bethards, Charles William, 4,038,603, Cl. 325-182.000.
Crowell, Kenneth E., 4,037,899, Cl. 339-17.00C.
Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., 4,038,505, Cl. 200-51.100.
Gutteridge, Ronald J.; and Stickney, George A., 4,037,306, Cl. 29-577.000.
Nelson, John L.; and Trego, Douglas G., 4,038,658, Cl. 343-7.700.
Pausche, John William, 4,037,812, Cl. 248-218.400.

Mott, Richard C., to Honeywell Inc. Sliding tube fluidic controller. 4,037,625, Cl. 138-46.000.

Motzer, Alfred E., to W. E. Bassett Company, The. Key retaining device. 4,037,443, Cl. 70-459.000.

Mouwen, Herman Charles: *See—*
Luceyk, Alfred Robert; Mouwen, Herman Charles; and Weinberg, Steven Louis, 4,038,194, Cl. 210-436.000.

Mowell, Jerry M.: *See—*
Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.

Mowry, William H., Jr.: *See—*
Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.

Moyer, Richard A.; and Patton, Joseph D., to Asplundh Tree Expert Company. Mobile lift apparatus with electric power system. 4,037,684, Cl. 182-2.000.

Mozic, Joseph Daniel: *See—*
Mock, Kenneth John; and Mozic, Joseph Daniel, 4,037,470, Cl. 73-190.0EW.

Mshvenieradze, Alexei Pimenovich: *See—*
Komarov, Jury Ivanovich; Titov, Dmitry Vladimirovich; Kovalev, Gennady Ivanovich; and Mshvenieradze, Alexei Pimenovich, 4,037,628, Cl. 139-436.000.

Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., to Allied Chemical Corporation. Aqueous dispersion of particulate spheroidal polytetrafluoroethylene. 4,038,230, Cl. 260-29.60F.

Mueller, Thomas L., to Engel Industries, Inc. Insulation blanket shearing and applying machine for ductwork and the like. 4,038,128, Cl. 156-355.000.

Muir, Andrew Redvers, to Perkin-Elmer Corporation, The. Recording chart lock. 4,038,664, Cl. 346-1.000.

Mukae, Kazuo: *See—*
Namba, Masaharu; Nagasawa, Ikuo; and Mukae, Kazuo, 4,038,217, Cl. 252-521.000.

Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, to Ciba-Geigy Corporation. Stabilizing polyolefins with diacyl dihydrazides. 4,038,247, Cl. 260-45.9NC.

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Griner, Arthur J.; and Koppa, Daniel Anthony, 4,038,007, Cl. 425-259.000.
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Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, 4,038,168, Cl. 204-197.000.

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Tokuyasu, Kiyochika; Yokobori, Takeshi; and Nakahara, Chizuko, 4,038,141, Cl. 195-66.00R.

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Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, 4,037,890, Cl. 308-187.000.

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Tai, Wen Ten, 4,038,318, Cl. 260-567.60P.

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May, Klaus D.; and Nasuta, Anthony T., Jr., 4,038,568, Cl. 307-351.000.

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Frampton, Orville D., 4,038,211, Cl. 252-435.000.

National Patent Development Corporation: *See*—
Rostoker, Martin; and Levine, Leon, 4,038,264, Cl. 260-79.30M.

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Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.

National Research Development Corporation: *See*—
Randall, John Edward, 4,037,650, Cl. 165-29.000.

Naumann, Helmut: *See*—
Callahan, George Edgar, 4,037,481, Cl. 73-454.000.

Naumenko, Viktor Arsenievich: *See*—
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.

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Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, 4,038,224, Cl. 260-15.00R.

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Dersch, James E.; and Maciey, James L., 4,037,578, Cl. 123-179.0BG.

NCR Corporation: *See*—
Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.
Golobay, Gary L.; and Schrag, Robert L., 4,037,704, Cl. 197-1.00R.

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Eliasson, Rune; and Nedenskov, Poul, 4,038,305, Cl. 260-468.00K.

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Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, 4,037,368, Cl. 51-314.000.

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Webster, Donald R.; and Ganssle, Eugene R., 4,037,970, Cl. 356-188.000.

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O'Handley, Robert Charles; Nesbitt, Ethan Allen; and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.

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Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, 4,038,223, Cl. 260-9.000.

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Fisch, Richard S.; and Newman, Norman, 4,038,080, Cl. 96-60.0BF.

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Guay, Wilbur J., 4,038,362, Cl. 423-40.000.

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Thorpe, Laurence Joseph; and Nicholson, Burnard Eugene, 4,038,683, Cl. 358-19.000.

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Nicholson, John Patrick, 4,038,095, Cl. 106-118.000.

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Schroder, Rolf; and Nicko, Reinhard, 4,038,671, Cl. 354-197.000.

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Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., 4,038,494, Cl. 178-69.100.

Niino, Kiyoshi: *See*—
Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, 4,038,287, Cl. 260-309.700.

Nims, Jerry Curtis: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,037,950, Cl. 352-58.000.

Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, 4,037,828, Cl. 266-271.000.

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Anzai, Satoru, 4,037,943, Cl. 350-294.000.
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Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, 4,038,366, Cl. 423-234.000.

Nippon Paint Co., Ltd.: *See*—
Sakurai, Kiyomi; and Takimoto, Yasuyuki, 4,038,078, Cl. 96-35.100.

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Takeuchi, Hidemaro, 4,038,067, Cl. 75-257.000.

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Nakajima, Yasuo; and Yoneda, Kenji, 4,038,034, Cl. 23-255.00E.

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Williams, E. Alan, 4,037,370, Cl. 53-375.000.

Nolte, Charles P. Tuning loop for attachment to a citizens band radio antenna. 4,038,661, Cl. 343-715.000.

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Willums, Jan-Olaf, 4,037,874, Cl. 299-8.000.

Nordebo, Knut Assar. Multi-phase generator. 4,038,575, Cl. 310-179.000.

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Sundberg, B. E. Ingvar, 4,037,512, Cl. 85-79.000.

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Noren, Gerry K.; and Diehl, Richard C., to Calgon Corporation. Oil soluble polymeric flocculants. 4,038,176, Cl. 208-180.000.

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Day, Paul Edwin; and Kenney, George Churchill, 4,038,663, Cl. 346-1.000.

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Dupuis, Jean Marcel, 4,037,772, Cl. 228-1.00R.

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Baumgartner, Hans R.; and Skrovanek, Stephen D., 4,038,092, Cl. 106-73.400.
Haywood, George L., 4,038,047, Cl. 51-295.000.
Supkis, Stanley J., 4,038,046, Cl. 51-295.000.

Nossiter, Clarence Frank, to Enfield Industrial Engines Limited. Marine drive units. 4,037,558, Cl. 115-41.0HT.

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Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, 4,038,337, Cl. 260-683.200.

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Zuleeg, Rainer; and Notthoff, Johannes K., 4,038,563, Cl. 307-205.000.

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Koppel, Gary A.; and Nummy, Laurence J., 4,038,275, Cl. 260-243.00C.

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Weman, Per Olof, 4,037,873, Cl. 297-388.000.

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Oger, Jacques, to Pont-A-Mousson S.A. Voussoir for a casing. 4,037,417, Cl. 61-45.00R.

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Oil Shale Corporation (Tosco), The: *See*—
Haberman, Charles E., 4,038,100, Cl. 106-307.000.

Okamoto, Yoshinori; and Tsuruoka, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Oil level detection device in engine oil pan. 4,037,471, Cl. 73-324.000.

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Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, 4,037,890, Cl. 308-187.000.

O'Keeffe, Terence W.: *See*—
Braginski, Aleksander I.; and O'Keeffe, Terence W., 4,038,541, Cl. 235-194.000.

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Miyahara, Masahiro; and Suzuki, Hideo, 4,038,530, Cl. 235-150.530.

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Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich, 4,038,353, Cl. 261-89.000.

Olin Corporation: *See*—
Cummings, Thomas L., 4,037,304, Cl. 29-427.000.
Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.
Tobin, John H., 4,038,331, Cl. 260-651.00F.
Tyler, Derek E.; Dickinson, David W.; and Dore, James E., 4,038,068, Cl. 75-76.000.
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 4,037,445, Cl. 72-60.000.

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Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,037,775, Cl. 229-15.000.

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Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.

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deBoer, Nico; and Olsen, Robert L., 4,037,422, Cl. 61-72.400.

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Lanz, Donald D.; and Hencye, Ronald E., 4,037,403, Cl. 59-8.000.

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Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

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Hargreaves, Walter A., 4,038,201, Cl. 252-300.000.

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Carr, Larry R., 4,037,973, Cl. 356-206.000.

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Marsden, James Glenn; and Orenski, Peter Joseph, 4,038,456, Cl. 428-391.000.

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Kuehn, Melvin C., 4,038,242, Cl. 260-39.00R.

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Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.

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Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., 4,038,116, Cl. 149-105.000.

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Hines, Charles E.; and Williams, Dwight E., 4,037,614, Cl. 135-5.00A.

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Ozawa, Masahiro, to Fuji Jukogyo Kabushiki Kaisha. Cylinder head for multi-cylinder internal combustion engine. 4,037,408, Cl. 60-282.000.

Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich. Device for reducing toxicity of I.C. carburettor engine under forced idling conditions. 4,038,349, Cl. 261-41.00D.

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Palmer, Billy W.; and Wright, Howard N., Jr., to Eastman Kodak Company. Process for purification of neopentyl glycol. 4,038,329, Cl. 260-637.00P.

Paluch, Edward S., to Reliable Electric Company. Telephone distribution frame connector assembly. 4,037,910, Cl. 339-198.00R.

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Parker, William H., to Del Norte Technology, Inc. Oil and gas well disaster valve control system. 4,038,632, Cl. 340-18.0NC.

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Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Stereospecific syntheses of 24R,25- and 24S,25-dihydroxycholesterol and alkanoyl derivatives thereof. 4,038,272, Cl. 260-239.55R.

Pasturczak, Vincent S.; and Kerstein, Melvin T., to Bell & Howell Company. Slot load projector. 4,037,949, Cl. 352-158.000.

Pate, Harold T., to Indian Head Inc. Pipe bracket and clamp. 4,037,810, Cl. 248-68.0CB.

Paterson Zochonis & Company Limited: *See—*
Cleaver, David Frederick, 4,038,388, Cl. 424-227.000.

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Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., to BASF Wyandotte Corporation. Removal of low level hardness impurities from brine feed to chlorine cells. 4,038,365, Cl. 423-161.000.

Patry, Francis Joseph, to Johns-Manville Corporation. Roof facia arrangement. 4,037,372, Cl. 52-96.000.

Patterson, Hubert A.: *See—*
Elder, James H.; and Patterson, Hubert A., 4,038,605, Cl. 328-119.000.

Patton, Charles E.: *See—*
Rodenberg, Herbert G.; and Patton, Charles E., 4,038,297, Cl. 260-413.000.

Patton, Joseph D.: *See—*
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Paulonis, Daniel Francis: *See—*
Duvall, David Scott; and Paulonis, Daniel Francis, 4,038,041, Cl. 428-576.000.

Pausche, John William, to Motorola, Inc. Adaptable enclosure mounting system. 4,037,812, Cl. 248-218.400.

Pawlowski, Thomas Dominic: *See—*
Meyers, George Leroy; and Pawlowski, Thomas Dominic, 4,037,776, Cl. 229-43.000.

Pearson, Kenneth George, to United Kingdom Atomic Energy Authority. Nuclear reactors. 4,038,132, Cl. 176-38.000.

Pease, James F. Method of producing an electrical heating element and fitting assembly. 4,037,314, Cl. 29-611.000.

Pedersen, Carl Oluf, to J. I. Case Company. Material handling bucket dual cylinder system. 4,037,743, Cl. 214-140.000.

Peebles, William H., Jr.: *See—*
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Peglow, James D.: *See—*
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Pelster, Heinrich; and Beck, Uwe, to Bayer Aktiengesellschaft. Process for preparing 2-nitro-4,6-dichloro-5-methylphenol. 4,038,328, Cl. 260-622.00R.

Pemsler, J. Paul: *See—*
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Pendleton, Darrell D., to Garlock Inc. Method of making a shaft seal with dual lip. 4,038,359, Cl. 264-263.000.

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Peng, Ting-fu; and Peng, Eng-Chin, to Birch, Terrell C. Bean sprout method and apparatus for growing same. 4,037,359, Cl. 47-14.000.

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Pepmeier, Carl R., to FMC Corporation. Apparatus for molding of filament-reinforced plastic rods. 4,038,018, Cl. 425-505.000.

Perales, Fernando. Multiway pneumatic valve and its application to brake. 4,037,617, Cl. 137-118.000.

Perkin-Elmer Corporation, The: *See—*
Golay, Marcel J. E., 4,038,053, Cl. 55-160.000.
Muir, Andrew Redvers, 4,038,664, Cl. 346-1.000.

Perlant, Rene. Vaccine for the prevention and treatment of vascular conditions. 4,038,381, Cl. 424-89.000.

Perlmutter, Alan. Cigarette counting case. 4,037,719, Cl. 206-266.000.

Perrin, Herve, to La Technique Integrale. Rolling-contact bearings with threaded or grooved planet rollers. 4,037,893, Cl. 308-205.000.

Pertsev, Gennady Alexeevich: *See—*
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Peters, Sherman M. Access control system. 4,038,637, Cl. 340-147.0MD.

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Peterson, Hal D.: *See—*
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Peterson, William J., to Textron, Inc. Fastener driving apparatus utilizing high capacity fastener package. 4,037,771, Cl. 227-130.000.

Petro-Tex Chemical Corporation: *See—*
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Pflieger, Bernard; and Reiniche, Andre, to Compagnie Generale des Etablissements Michelin. Three phase heat treatment of steel sheet. 4,038,109, Cl. 148-12.00F.
Pflueger, John M.; and Hutcheson, William A., to Pflueger, John M. Aquarium viewing window. 4,037,563, Cl. 119-5.000.
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Chiesa, Peter Jordan, Jr., 4,038,195, Cl. 252-3.000.
Philco Corporation: *See—*
Hoesterey, Howard F., 4,038,547, Cl. 250-338.000.
Philip Morris Incorporated: *See—*
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Edmonds, James T., Jr.; and Campbell, Robert W., 4,038,263, Cl. 260-79.100.
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Pinhas, Henri, to Laboratoires Laroche Navarron. Substituted phenoxyalkylamines, process for their preparation and applications thereof. 4,038,319, Cl. 260-570.700.
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Plemitscher, Robert Antone, to Deere & Company. Drive means for an elevating scraper elevator. 4,037,334, Cl. 37-8.000.
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Poeta, Rolando. Wind motor. 4,037,983, Cl. 415-2.000.
Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, to Neste Oy. Novel segmented copolymers containing free hydroxyl groups and method of preparing the same. 4,038,223, Cl. 260-9.000.
Poklacki, Erwin Sigmund; and Kalnajs, Reinis, to Borg-Warner Corporation. Stabilized hydrocarbon gels and a method for their preparation. 4,038,207, Cl. 252-316.000.
Polaroid Corporation: *See—*
Land, Edwin H., 4,038,077, Cl. 96-29.00R.
Whiteside, George D.; and Johnson, Bruce K., 4,038,674, Cl. 354-230.000.
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, to AGFA-GEVAERT N.V. Development of photographic silver halide material. 4,038,075, Cl. 96-22.000.
Pollock, Gordon J. Interior partition structure with resiliently-biased panels. 4,037,380, Cl. 52-483.000.
Pollock, James Richard Allan; and Weir, Michael Joseph. Method of brewing beer. 4,038,420, Cl. 426-16.000.
Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, to International Business Machines Corporation. Wafer handler. 4,037,830, Cl. 269-21.000.
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Poncy, Mark P.; Poncy, George W.; and Poncy, Richard P. Catheter placement system. 4,037,600, Cl. 128-214.400.
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Posel, John G., to International Ore Technology, Inc. Recovery of nitric acid soluble transition metals from sulfur and iron containing ores of the same. 4,038,361, Cl. 423-34.000.
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Bosso, Joseph F.; and Wismer, Marco, 4,038,166, Cl. 204-181.000.
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Otto, Jack M., 4,038,301, Cl. 260-437.00R.
Prenzel, Karl, to Ardie-Werk, GmbH. Hydraulic clutch actuating system. 4,037,697, Cl. 192-91.00R.
Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Method and apparatus for introducing geometrical perturbations in optical fiber waveguides. 4,038,062, Cl. 65-2.000.
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., to Mechanex Corporation, The. Lubricant seal. 4,037,848, Cl. 277-37.000.
Preston, Norman H.: *See—*
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Preus, Paul. Cable connector assembly for oil boom. 4,037,416, Cl. 61-1.00F.
Price, Edward E. Contact lens applicator. 4,037,866, Cl. 294-1.0CA.
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Puderbaugh, George; and Erman, Stanley, to Diemolding Corporation. Respiratory exerciser. 4,037,836, Cl. 272-99.000.
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, to Thomson-

Brandt. Data carrier optically readable by transmission and method of manufacturing such a data carrier. 4,038,524, Cl. 235-61.12N.
Pugh, Ralph A., to Exxon Nuclear Company, Inc. Locking means for fuel bundles. 4,038,137, Cl. 176-78.000.
Purcell, John R., to United States of America, Energy Research and Development Administration. Superconducting dipole electromagnet. 4,038,622, Cl. 335-216.000.
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Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,038,437, Cl. 426-656.000.
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,038,423, Cl. 426-72.000.
Keyser, William L.; and Zielinski, Walter J., 4,038,422, Cl. 426-72.000.
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Quarton, William T., to Honeywell Inc. Apparatus for producing smooth and continuous graphic displays from intermittently sampled data. 4,038,668, Cl. 235-151.000.
Quebec Iron & Titanium Corporation-Fer et Titane due Quebec, Inc.: *See—*
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Quinn, Halsey P., to Xerox Corporation. Regulated high voltage AC power supply with regulated D.C. bias current. 4,038,593, Cl. 323-4.000.
Quinn, Halsey P.; and Levinson, Donald B., to Xerox Corporation. Distortionless sine wave amplification. 4,038,594, Cl. 323-4.000.
R.M.C. Transport (New South Wales) Pty. Limited: *See—*
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Rader Companies, Inc.: *See—*
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Radiochemical Centre, Limited, The: *See—*
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Rae, James A., to Exxon Research and Engineering Company. Novel curing system for conjugated diene butyl elastomers. 4,038,472, Cl. 526-48.000.
Rafferty, Edson Howard; and Kletschka, Harold D., to Bio-Medicus, Inc. Pumping apparatus and process characterized by gentle operation. 4,037,984, Cl. 415-60.000.
Rahman, Matiur; and Coleman, Harold R., to Tee-pak, Inc. Method of coloring synthetic food casings. 4,038,438, Cl. 427-385.00R.
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Rapoport, Sidney L.; and Mitchell, Douglas F., to Rapoport Printing Corporation. Color lithography using a random pattern screen. 4,037,533, Cl. 101-211.000.
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Rath, Karl Friedrich. Apparatus for harvesting and bundling plants. 4,037,666, Cl. 171-61.000.
Rau, Peter: *See—*
Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, 4,038,133, Cl. 176-38.000.
Raulerson, James D. Continuous flow catheter device. 4,037,599, Cl. 128-214.400.
Rautimo, Pentti Jaakkima: *See—*
Kapanen, Aarne Albin; and Rautimo, Pentti Jaakkima, 4,038,162, Cl. 204-105.00R.
Ray, Robert D. Bicycle lock. 4,037,441, Cl. 70-233.000.
RCA Corporation: *See—*
Allen, James Austin, 4,038,682, Cl. 358-128.000.
Baker, Alfred Lynn, 4,038,686, Cl. 358-127.000.
Ball, Ervin Matthew, 4,038,616, Cl. 324-20.0CR.
Bazin, Lucas John, 4,038,685, Cl. 358-32.000.
Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, 4,038,655, Cl. 343-5.00W.
Dorsey, Denis Peter; and Rodda, William E., 4,038,581, Cl. 315-13.0ST.
Guyer, Robert Charles, 4,037,942, Cl. 350-285.000.
Harwood, Leopold Albert, 4,038,681, Cl. 358-20.000.
Kawamoto, Hirohisa, 4,038,106, Cl. 148-1.500.
Morrell, Albert Maxwell; and Irlbeck, Dennis Henry, 4,037,936, Cl. 350-189.000.
Schade, Otto Heinrich, Jr., 4,038,607, Cl. 330-13.000.
Schneider, Dennis Michael; and Bazin, Lucas John, 4,038,687, Cl. 358-165.000.
Takahashi, Tatsuo, 4,038,203, Cl. 252-301.40P.
Thorpe, Laurence Joseph; and Nicholson, Burnard Eugene, 4,038,683, Cl. 358-19.000.
Reactor Centrum Nederland (Stichting): *See—*
Votocek, Otakar, 4,038,202, Cl. 252-301.10S.
Reber, Russell H., to Purex Corporation Ltd. Energy saving vapor degreasing apparatus. 4,038,155, Cl. 202-170.000.
Record, Robert George Hamilton, to George Kent Limited. Bonding of metals to solid electrolytes. 4,037,773, Cl. 228-122.000.
Redman, Theodore Milton: *See—*
Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.
Reed, Frederick P., to United States of America, Army. Magnetic cartridge chambering and bolt holding system. 4,037,344, Cl. 42-16.000.
Reed Tool Company: *See—*
Justman, Daniel B., 4,037,673, Cl. 175-371.000.
Reichel, Sigrid; and Gottfried, Rudolf, to VEB Chemiewerk Nuenchritz. Process for preparing 2-(cyclohexenyl-4-)ethyl-silicon compounds and novel products made thereby. 4,038,302, Cl. 260-448.20E.
Reichenbacher, Paul H.: *See—*
Martan, Michael; and Reichenbacher, Paul H., 4,038,325, Cl. 260-612.00D.
Reiff, Almer A.: *See—*
Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., 4,037,374, Cl. 52-179.000.
Reineke, Charles E., to Dow Chemical Company, The. Char-forming polymer compositions. 4,038,245, Cl. 260-45.70S.
Reinhardt, Walter: *See—*
Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, 4,038,476, Cl. 528-485.000.
Reiniche, Andre: *See—*
Pflieger, Bernard; and Reiniche, Andre, 4,038,109, Cl. 148-12.00F.
Reis, Walter; and Boll, Dietmar, to Reis, Walter. Workpiece transport apparatus. 4,037,731, Cl. 214-1.0BB.
Reiser, Roger W.; and Summers, Gary K. Water glove. 4,037,790, Cl. 239-529.000.
Reissland, Martin-Ulrich. *See—*
Schweizer, Walter; and Reissland, Martin-Ulrich, 4,037,967, Cl. 356-135.000.
Reith, James E.: *See—*
Booth, William M.; and Rieth, James E., 4,037,326, Cl. 33-139.000.
Reliable Electric Company: *See—*
Paluch, Edward S., 4,037,910, Cl. 339-198.00R.
Rembold, Heinz: *See—*
Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.
Remmington, Timothy Alan; and Robinson, William, to Imperial

Chemical Industries Limited. Process for extruding and quenching a polymeric film. 4,038,354, Cl. 264-102.000.
Remner, Robert A.; and Rowland, Leroy V., to Aetna-Standard Engineering Company. Shellpusher for plug mill or the like. 4,037,453, Cl. 72-252.000.
Renner, Alfred: *See—*
Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.
Reno, Woodrow James, to Becton, Dickinson and Company. Method for detecting endotoxins. 4,038,147, Cl. 195-103.50R.
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-aryl-N'-(phenyl-or phenoxy-alkyl)-piperazines and salts thereof. 4,038,279, Cl. 260-268.0BQ.
Renth, Ernst-Otto: *See—*
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
Renton, Stanley: *See—*
Crowther, John Cooper; and Renton, Stanley, 4,038,160, Cl. 204-51.000.
Replacement Products Industries Corporation: *See—*
Collins, David R.; and Katz, Sheldon N., 4,037,378, Cl. 52-397.000.
Reth, Erich: *See—*
Grimpe, Karl; and Reth, Erich, 4,037,452, Cl. 72-249.000.
Reuter, Floyd W., to Massey-Ferguson Inc. Pneumatic seed dispensing apparatus. 4,037,755, Cl. 221-211.000.
Revy von Belvard, Peter: *See—*
Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.
Reynolds Metals Company: *See—*
Ashton, Richard F., 4,038,514, Cl. 219-126.000.
Reynolds, Richard L., to Litton Systems, Inc. Fastener manufacturing method. 4,037,281, Cl. 10-10.00R.
Reznicek, Kurt, to Bell Telephone Laboratories, Incorporated. Hermetically sealed envelope and method of making the same. 4,037,749, Cl. 220-2.30R.
Reznikova, Svetlana Stepanovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Rhees, Raymond C.; and Halker, Bruce B. Anode containing lead dioxide deposit and process of production. 4,038,170, Cl. 204-290.00R.
Rhoads, Roger R., to Owens-Illinois, Inc. Container with improved heat shrunk cellular sleeve. 4,038,446, Cl. 428-35.000.
Rhone-Poulenc Industries: *See—*
Marin, Gilbert, 4,038,371, Cl. 423-342.000.
Rhone-Poulenc S.A.: *See—*
Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.
Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.
Chabardes, Pierre; and Julia, Marc, 4,038,323, Cl. 260-607.0AR.
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.
Foucras, Jacques, 4,038,519, Cl. 219-301.000.
Ricciardi, Franc M., to Richton International Corporation. Wallet construction. 4,037,634, Cl. 150-36.000.
Richard, Jean-Claude: *See—*
Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, 4,038,576, Cl. 313-101.000.
Richard Wolf GmbH: *See—*
Heckele, Helmut, 4,037,588, Cl. 128-11.000.
Richards, John S., to Rockwell International Corporation. Method and apparatus for phototypesetting. 4,038,493, Cl. 178-15.000.
Richards, Raymond S.: *See—*
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; and Claxton, George P., 4,038,412, Cl. 424-280.000.
Shemano, Irving, 4,038,400, Cl. 424-267.000.
Richter, George N.: *See—*
Potter, Clyde E.; and Richter, George N., 4,038,186, Cl. 210-92.000.
Richter, Gerhard; and Poppel, Peter, to USM Corporation. Machine for the processing of hides and skins. 4,037,437, Cl. 69-42.000.
Richton International Corporation: *See—*
Ricciardi, Franc M., 4,037,634, Cl. 150-36.000.
Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., to United States of America, Navy. Exhaust regulator valve for push-pull diving system. 4,037,594, Cl. 128-142.300.
Rieschel, Hartmut, to Maschinenfabrik Koppern GmbH & Co., KG. Method for the briquetting of metal swarf, pellets, and powders with roller presses. 4,037,303, Cl. 29-420.500.
Rieth, James E.: *See—*
Booth, William M.; and Rieth, James E., 4,037,326, Cl. 33-139.000.
Rigid-Pak Corporation: *See—*
Stubbs, Edgar S., Jr., 4,037,748, Cl. 215-256.000.
Riikonen, Douglas L.: *See—*
Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., 4,038,537, Cl. 235-153.0AM.
Riley, Harry D. Fence construction. 4,037,788, Cl. 239-207.000.
Risberg, Robet L., to Miller Electric Manufacturing Company. Asymmetrical A.C. welder. 4,038,515, Cl. 219-131.00R.
Ritzerfeld, Gerhard. Rotary printing machine. 4,037,531, Cl. 101-91.000.
Rix, Albert; Fuchs, Hans; and Onuscheit, Jens, to Olympia Werke AG. Centrifugal coupling. 4,037,698, Cl. 192-105.0CE.
Robert Bosch G.m.b.H.: *See—*
Dworak, Wilhelm, 4,038,000, Cl. 418-102.000.
Fetzer, Martin, 4,037,914, Cl. 339-253.00R.
Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.
Roberti, Anthony M.: *See—*
Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, 4,037,830, Cl. 269-21.000.
Roberts, Harold G.; and Brooks, Robert J. Laundry sorting machine. 4,037,725, Cl. 209-122.000.
Roberts, James E., Jr., to Standard Oil Company (Indiana). High strength composite pipe structure having leakproof joints. 4,037,626, Cl. 138-109.000.
Roberts, James L., to Honeywell Inc. Quadrature correlation pulse detector. 4,038,540, Cl. 235-181.000.
Roberts, Richard W., to Borg-Warner Corporation. Control system for variable displacement compressor. 4,037,993, Cl. 417-222.000.
Robertshaw Controls Company: *See—*
Bauer, Werner R.; and Sepso, Roger P., 4,037,317, Cl. 29-622.000.
Flumm, Paul T.; and Harris, Vernon B., 4,037,398, Cl. 58-22.900.
Robertson, Neil George Douglas, to Wiggins Teape Limited. Coated paper. 4,038,445, Cl. 427-150.000.
Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., to ICN Pharmaceuticals, Inc. 6-Aminocarbonyl purine 3',5'-cyclic nucleotides. 4,038,480, Cl. 536-27.000.
Robinson, Bruce R.: *See—*
Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.
Robinson, Joseph Gordon; and Rogers, Edward Aubrey, to Coal Industry (Patents) Limited. Resol type varnishes containing tar acids. 4,038,236, Cl. 260-32.80R.
Robinson, William: *See—*
Remmington, Timothy Alan; and Robinson, William, 4,038,354, Cl. 264-102.000.
Roccaforte, Harry I., to Hoerner Waldorf Division - Champion Int. Corporation. Display carton. 4,037,717, Cl. 206-45.140.
Rochet, Michel: *See—*
Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.
Rock, Erich; and Mages, Bernhard. Withdrawal guide for drawers or the like. 4,037,885, Cl. 308-3.800.
Rock, James Edward: *See—*
Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.
Rockwell International Corporation: *See—*
Christe, Karl O., 4,038,374, Cl. 423-466.000.
Feintuch, Paul L., 4,038,536, Cl. 235-152.000.
Fisher, Frank H.; and Jovick, Raymond John, 4,037,690, Cl. 188-181.00R.
Keese, Beverly W., 4,037,694, Cl. 192-4.00A.
Nelson, Laurence G., 4,038,517, Cl. 219-216.000.
Richards, John S., 4,038,493, Cl. 178-15.000.
White, Stanley A., 4,038,495, Cl. 179-1.0SA.
Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,037,547, Cl. 112-121.270.
Rodda, William E.: *See—*
Dorsey, Denis Peter; and Rodda, William E., 4,038,581, Cl. 315-13.0ST.
Rodenberg, Herbert G.; and Patton, Charles E., to Emery Industries, Inc. High molecular weight monocarboxylic acids and ozonization process for their preparation. 4,038,297, Cl. 260-413.000.
Rodway, William George: *See—*
Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, 4,038,231, Cl. 260-29.60F.
Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., to Janssen Pharmaceutica N.V. Racemates and optical isomers of 1-(1-phenylethyl)-1H-imidazole-5-carboylic acid derivatives. 4,038,286, Cl. 260-309.000.
Rogers, Edward Aubrey: *See—*
Robinson, Joseph Gordon; and Rogers, Edward Aubrey, 4,038,236, Cl. 260-32.80R.
Rohm GmbH: *See—*
Hanstein, Friedrich; and Moench, Theodor Peter, 4,038,360, Cl. 264-293.000.
Rohm and Haas Company: *See—*
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,038,065, Cl. 71-76.000.
Rohr, Franz-Josef, to BBC Brown Boveri & Company Limited. Solid-electrolyte battery, particularly for the storage of electrical energy. 4,038,462, Cl. 429-30.000.
Rojahn, Fred H.; and Lichtenberg, Jose. Slide fastener stringer. 4,037,295, Cl. 24-205.13D.
Rojey, Alexandre, to Institut Francais du Petrole. Cold producing process. 4,037,426, Cl. 62-117.000.

Rolf, Lechler: *See*—
Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.

Romero, Victor R., to Eagle Picher Industries, Inc. Store merchandising apparatus. 4,037,851, Cl. 280-79.300.

Romich, Wilfried Robert: *See*—
Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, 4,037,830, Cl. 269-21.000.

Romick, Jerome M. Visible file-card system. 4,037,339, Cl. 40-104.120.

Ronai, Anne A. Massage and dispensing apparatus. 4,037,977, Cl. 401-209.000.

Ronne, Per-Axel Carsten: *See*—
Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, 4,037,671, Cl. 173-2.000.

Rose, James J.; and Horton, Edward L., to Enviro-Blast International. Vacuum cleaning device. 4,037,290, Cl. 15-345.000.

Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Beta-amino nitrile catalysts for polyurethane preparation. 4,038,210, Cl. 252-426.000.

Rosenbaum, Phillip. Model airplane drive and control system. 4,037,358, Cl. 46-253.000.

Rosenberger, Siegfried: *See*—
Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.

Rosler, Wulff: *See*—
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.

Rostoker, Martin; and Levine, Leon, to National Patent Development Corporation. Hema copolymers having high oxygen permeability. 4,038,264, Cl. 260-79.30M.

Roth, Thomas P., to Andersen 2000, Inc. Closed circuit sampler. 4,038,057, Cl. 55-270.000.

Rothmans of Pall Mall Canada Limited: *See*—
Kopachkov, Slavco A., 4,037,804, Cl. 242-68.300.

Roussel-UCLAF: *See*—
Mendy, Francois; Delage, Michel; and Teissier, Jean, 4,038,421, Cl. 426-72.000.

Routien, John B.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.

Rowe, Neal E.: *See*—
Wolski, Jerome C.; and Rowe, Neal E., 4,038,585, Cl. 361-334.000.

Rowenta-Werke GmbH: *See*—
Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.

Rowland, Leroy V.: *See*—
Remner, Robert A.; and Rowland, Leroy V., 4,037,453, Cl. 72-252.000.

Roy, Joseph Jean; and Roy, Lorenzo. Heating system having high-low temperature limit controlled auxiliary boiler. 4,037,779, Cl. 237-8.00R.

Roy, Lorenzo: *See*—
Roy, Joseph Jean; and Roy, Lorenzo, 4,037,779, Cl. 237-8.00R.

Rubin, Erlen Manuilovich: *See*—
Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.

Ruckstuhl, Franz, to Metacon AG. Protective nozzle for the outlet of a casting ladle. 4,037,762, Cl. 222-591.000.

Ruf, Max, to Audi NSU Auto Union Aktiengesellschaft. Process for producing metal rings. 4,037,455, Cl. 72-324.000.

Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, to Schering Aktiengesellschaft. Nitroimidazole derivatives and process for the preparation thereof. 4,038,410, Cl. 424-273.000.

Ruhrgas Aktiengesellschaft: *See*—
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.

Runciman, Herbert Morrison; and Berry, Peter John, to Barr and Stroud Limited. Radiation scanning system with two relatively movable reflectors. 4,037,920, Cl. 350-7.000.

Ruse, Edward Thipthorp. Powered invalid-chairs. 4,037,676, Cl. 180-6.500.

Russell, Carl D. Electric heat bonding tape method for construction panels. 4,038,120, Cl. 156-71.000.

Russo, Adolph D.: *See*—
Diebold, William H.; and Russo, Adolph D., 4,037,383, Cl. 52-664.000.

Russo Architectural Metals, Inc.: *See*—
Diebold, William H.; and Russo, Adolph D., 4,037,383, Cl. 52-664.000.

Rutherford, David: *See*—
Suschitzky, John Louis; and Rutherford, David, 4,038,413, Cl. 424-295.000.

Ryan, Edward Clyde: *See*—
Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.

Ryan, Mark D.: *See*—
Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., 4,038,494, Cl. 178-69.100.

Ryan, Richard G.: *See*—
Martin, Donald P.; and Ryan, Richard G., 4,037,705, Cl. 197-1.00R.

Rybalko, Galina Ivanovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, to Matsushita Electric Corporation of America. Frequency synthesizer tuning system with manual fine tuning control. 4,038,689, Cl. 358-191.000.

S.R.M. Hydromekanik Aktiebolag: *See*—
Ahlen, Karl Gustav, 4,037,432, Cl. 64-27.00L.

Saari, Walfred S., to Merck & Co., Inc. Antihypertensive amino acid esters. 4,038,411, Cl. 424-274.000.

Sabarly, Louis J., to Societe Industrielle des Charmilles. Steam trap. 4,037,784, Cl. 236-56.000.

Sachar, Kenneth S.: *See*—
Melcher, James R.; Sachar, Kenneth S.; and Zahedi, Karim, 4,038,049, Cl. 55-2.000.

Saffran, Edward P., to Envirex Inc. Microscreen drum. 4,038,187, Cl. 210-108.000.

Saint-Gobain Industries: *See*—
Vatin, Raymond, 4,037,500, Cl. 83-7.000.

Saito, Hiroshi: *See*—
Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, 4,038,168, Cl. 204-197.000.

Saito, Koetsu: *See*—
Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, 4,037,933, Cl. 350-161.00W.

Saito, Shizuo: *See*—
Ido, Kazuo; and Saito, Shizuo, 4,037,931, Cl. 350-160.0LC.

Saito, Takeo: *See*—
Kitai, Kiyoshi; Saito, Takeo; and Seki, Youichi, 4,038,675, Cl. 354-238.000.

Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Photographic camera which can use a film cartridge housing a film containing sound recording belt. 4,037,948, Cl. 352-29.000.

Sakamoto, Eiichi: *See*—
Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, 4,038,081, Cl. 96-66.300.

Sakata, Isao: *See*—
Higashiyama, Tatsuo; and Sakata, Isao, 4,038,270, Cl. 536-4.000.

Sakurai, Kiyomi; and Takimoto, Yasuyuki, to Nippon Paint Co., Ltd. Process using suction to form relief images. 4,038,078, Cl. 96-35.100.

Salatiello, Peter P.: *See*—
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.

Salemi, Nicholas A., to Westinghouse Electric Corporation. Electric resistor. 4,038,628, Cl. 338-318.000.

Salmon, Michel: *See*—
Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.

Sammis, George L., to Mach III, Inc. Method for printing a color design on a release paper for heat transfer to a fabric material. 4,038,123, Cl. 156-240.000.

Sammons, Martin C.: *See*—
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.

Sampson, Sheldon E.; and Cargill, Don A., to Cargill Detroit Corporation. Planetary straightening machine. 4,037,447, Cl. 72-92.000.

Samson Apparatebau AG: *See*—
Jeschke, Norbert, 4,037,619, Cl. 137-492.500.

Sandberg, Nils Arne, to Ingenjorsfirman N.A. Sandbergs Industrikonstruktioner AB. Method of controlling a mobile suction device for sucking suspendible material from the bottom of a liquid body, and an apparatus for carrying out the method. 4,037,335, Cl. 37-58.000.

Sander, Gottfried, to Hermann Berstorff Maschinenbau GmbH. Multiple-roll calendars for producing thermoplastics film. 4,038,012, Cl. 425-363.000.

Sandner, Michael Ray: *See*—
Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 4,038,210, Cl. 252-426.000.

Sandor, Sylvester R.: *See*—
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.

Sandoz Ltd.: *See*—
Groebke, Wolfgang, 4,038,269, Cl. 260-207.000.

Sandrock, Don G.; and Hoag, Peter J., to Fiat-Allis Construction Machinery, Inc. Engine compartment enclosure. 4,037,682, Cl. 180-69.00R.

Saner, Kaspar, to Wirth, Gallo and Company. Casing. 4,037,903, Cl. 339-75.00R.

Sankey, Edwin W., to Marion Power Shovel Company, Inc. Frame construction for power shovels and the like. 4,037,894, Cl. 308-227.000.

Sansing, James Earl, Jr.: *See*—
Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.

Sanyo Electric Co., Ltd.: *See*—
Miyamoto, Seiji, 4,038,684, Cl. 358-27.000.

Saracsan, Jeffrey W.: *See*—
Finelli, Anthony F.; and Saracsan, Jeffrey W., 4,038,256, Cl. 260-75.0NH.

Sarich, Tony Ralph. Orbital engine with stabilizing plate. 4,037,997, Cl. 418-61.00R.

Sarkes Tarzian, Inc.: *See*—
Valdettaro, Alarico A., 4,037,482, Cl. 74-10.410.

Sarmiento, Constante C.: *See*—
Gonsalves, Michael; and Sarmiento, Constante C., 4,037,667, Cl. 172-14.000.

Sarno, Jay J. Bath tub therapeutic pad. 4,037,591, Cl. 128-33.000.

Sasaki, Ichiemon: *See*—
Nishizawa, Jun-ichi; Sasaki, Ichiemon; and Takahashi, Kaoru, 4,038,610, Cl. 331-94.50H.

Sasaki, Yukio: *See*—
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.

Sate-lite Mfg. Co.: *See*—
May, Louis, 4,037,924, Cl. 350-97.000.

Sato, Akio: *See*—
Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.

Sato, Fumio. Silencing method and silencer device in crank press machine. 4,037,458, Cl. 72-429.000.

Sato, Kozo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.

Sato, Takayuki: *See*—
Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.

Satosen Company Limited: *See*—
Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.

Savio, Ermanno: *See*—
Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,037,802, Cl. 242-47.050.

Sawhney, Dulari L.: *See*—
Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.

SCA Development Aktiebolag: *See*—
Peterson, Viking Per, 4,037,792, Cl. 241-18.000.

Scannell, William G., to Chromium Industries, Inc. Method of treating electroless nickel plating bath. 4,038,085, Cl. 106-1.000.

Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of wire insulation varnish resins suitable chiefly for application in the melted state. 4,038,254, Cl. 260-75.00N.

Schade, Otto Heinrich, Jr., to RCA Corporation. Complementary field effect transistor amplifier. 4,038,607, Cl. 330-13.000.

Schaefer, Philipp: *See*—
Hagenbohmer, Bodo; and Schaefer, Philipp, 4,037,636, Cl. 152-347.000.

Scheib, Harold A., to Bell & Howell Company. Film registering advancing mechanism. 4,037,954, Cl. 355-50.000.

Schering Aktiengesellschaft: *See*—
Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.

Schillinger, Joseph F., to Champion International Corporation. Glassware carrier. 4,037,721, Cl. 206-434.000.

Schinner, Thomas J.: *See*—
Kleimeyer, Vernon T.; and Schinner, Thomas J., 4,038,522, Cl. 235-61.70B.

Schippers, Steven J., to Sperry Rand Corporation. Digital communications line terminal compacter/expander. 4,038,652, Cl. 340-347.0DD.

Schlatter, Gerald L., to International Telephone and Telegraph Corporation. Densitometer. 4,037,459, Cl. 73-32.00A.

Schloemann-Siemag Aktiengesellschaft: *See*—
Streubel, Hans, 4,037,647, Cl. 164-282.000.

Schmid, Rolf: *See*—
Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.

Schmidger, Fritz. Baseboard for electrical installations. 4,037,900, Cl. 339-23.000.

Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, to Ernst Leitz Wetzlar GmbH. Apparatus for determining photoelectrically the position of at least one focusing plane of an image. 4,037,958, Cl. 356-4.000.

Schmidt, James A., Jr.: *See*—
Loui, Phillip J.; and Schmidt, James A., Jr., 4,037,813, Cl. 248-250.000.

Schmidt, Robert J.: *See*—
Graf, Peter E.; and Schmidt, Robert J., 4,038,096, Cl. 106-277.000.

Schmitter, Andre: *See*—
Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.

Schneider, Dennis Michael; and Bazin, Lucas John, to RCA Corporation. Video blanking circuit. 4,038,687, Cl. 358-165.000.

Schneider, Eckart: *See*—
Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.

Schneider, Franz: *See*—
Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, 4,037,730, Cl. 214-1.0BB.

Schneider, Irwin, to United States of America, Navy. Method for holographic storage. 4,038,647, Cl. 340-173.0CC.

Schnitzer, Johann Georg. Cereal mill. 4,037,798, Cl. 241-101.200.

Scholz, Gunter: *See*—
Ganter, Wolfgang; and Scholz, Gunter, 4,037,401, Cl. 58-58.000.

Schoofs, Richard J., to Catco Venture. Catalyst regeneration process. 4,038,209, Cl. 252-419.000.

Schor, Fred O. Sportsman's screwdriver and wrench. 4,037,275, Cl. 7-1.00G.

Schora, Frank C.: *See*—
Meissner, Herman P.; and Schora, Frank C., 4,037,653, Cl. 165-1.000.

Schotz, Larry A. Vehicle intrusion alarm circuit. 4,038,635, Cl. 340-63.000.

Schrag, Robert L.: *See*—
Golobay, Gary L.; and Schrag, Robert L., 4,037,704, Cl. 197-1.00R.

Schreiber, Bruno: *See*—
Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.

Schreiber, Edward T. Exhaust heated hydrogen and oxygen producing catalytic converter for combustion engine. 4,037,568, Cl. 123-3.000.

Schrock, Andrew A. Collapsible livestock ramp. 4,037,564, Cl. 296-61.000.

Schroder, Rolf; and Nicko, Reinhard, to AGFA-Gevaert Aktiengesellschaft. Photographic apparatus with two picture taking lenses. 4,038,671, Cl. 354-197.000.

Schroder, Rolf, to AGFA-Gevaert Aktiengesellschaft. View finder for photographic apparatus utilizing objectives having different focal lengths. 4,038,673, Cl. 354-222.000.

Schroeder, Dwain R.: *See*—
Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., 4,037,594, Cl. 128-142.300.

Schroer, Richard A.: *See*—
Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., 4,038,415, Cl. 424-317.000.

Schromm, Kurt: *See*—
Mentrup, Anton; Schromm, Kurt; Renth. Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.

Schroter, Herbert: *See*—
Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,038,414, Cl. 424-304.000.

Schuetz, James W., to Aetna-Standard Engineering Company. Continuous flow plug mill system. 4,037,449, Cl. 72-209.000.

Schuetz, James W., to Aetna-Standard Engineering Company. Piercing and reeling mill construction with removable cap. 4,037,451, Cl. 72-238.000.

Schulte, Harold F.: *See*—
Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, 4,037,364, Cl. 51-415.000.

Schultz, Edward H., Jr., to Nagel-Chase Manufacturing Company. Pulley. 4,037,486, Cl. 74-230.800.

Schultz, Frederick Arthur: *See*—
Orlando, Anthony William; and Schultz, Frederick Arthur, 4,037,732, Cl. 214-1.0BB.

Schultz, Peter; and Martinen, Hinrich, to Up Geratebau-und Vertriebs GmbH, Firma. Method of and apparatus for measuring defects in sealings. 4,037,724, Cl. 209-111.70R.

Schulz, Gunter: *See*—
Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, 4,038,550, Cl. 250-358.00P.

Schulze, Robert R.; and Ladd, Floyd R., to said Robert B. Schulze; by said Floyd R. Ladd. Method of charging a cryogenic probe. 4,037,631, Cl. 141-2.000.

Schundehutte, Karl Heinz: *See*—
Moritz, Karl Ludwig; and Schundehutte, Karl Heinz, 4,038,268, Cl. 260-156.000.

Schwartz, Jean: *See*—
Wermuth, Camille Georges; and Schwartz, Jean, 4,038,317, Cl. 260-566.0AE.

Schwartz, Joseph: *See*—
Krapcho, John; and Schwartz, Joseph, 4,038,274, Cl. 260-240.00F.

Schwartz, Willis T., Jr., to Hooker Chemicals & Plastics Corporation. Low profile additives in polyester systems. 4,038,341, Cl. 260-862.000.

Schwartz, Willis T., Jr., to Hooker Chemicals & Plastics Corporation. Low profile additives in polyester systems. 4,038,342, Cl. 260-862.000.

Schwarz, Katica: *See*—
Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.

Schwarzer, Henry: *See*—
Bayer, Arthur J.; and Schwarzer, Henry, 4,037,852, Cl. 280-87.04A.

Schweers, William Edwin, to Lawrence Peska Associates, Inc., a part interest. Multiple section curtain rod. 4,037,726, Cl. 211-105.500.

Schweizer, Walter; and Reissland, Martin-Ulrich, to VDO Adolf Schindling AG. Apparatus for measuring the density of a liquid, utilizing the law of refraction. 4,037,967, Cl. 356-135.000.

Scott Paper Company: *See*—
Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., 4,038,127, Cl. 156-353.000.

Scott, Samuel C. Apparatus for forming a liner on a planar form means. 4,037,816, Cl. 249-83.000.

Sebenda, Jan: *See*—
Stehlicek, Jaroslav; and Sebenda, Jan, 4,038,470, Cl. 526-29.000.

Seegall, Manfred I.: *See*—
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 4,037,473, Cl. 73-346.000.

Seibold, Paul F. Grass trimming device. 4,037,323, Cl. 30-206.000.

Seidel, Michael C.: *See*—
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,038,065, Cl. 71-76.000.
Seigel, Harold O.: *See*—
Kuehn, Lorne; and Seigel, Harold O., 4,037,328, Cl. 33-349.000.
Seikagaku Kogyo Co. Ltd.: *See*—
Tokuyasu, Kiyochika; Yokobori, Takeshi; and Nakahara, Chizuko, 4,038,141, Cl. 195-66.00R.
Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.
Kitai, Kiyoshi; Saito, Takeo; and Seki, Youichi, 4,038,675, Cl. 354-238.000.
Seiler, Adolf: *See*—
Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, 4,038,079, Cl. 96-60.0BF.
Seipp, Jan Vilas: *See*—
Miller, Wayne Russell; Seipp, Jan Vilas; and Penfold, Garn Farley, 4,037,519, Cl. 91-1.000.
Seitz, Hermann, to Infra-Vision Ltd. Zug. Panoramic pickup camera. 4,038,670, Cl. 354-96.000.
Seki, Yoichi: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.
Seki, Youichi: *See*—
Kitai, Kiyoshi; Saito, Takeo; and Seki, Youichi, 4,038,675, Cl. 354-238.000.
Sekido, Satoshi; and Arita, Tomohiko, to Matsushita Electric Industrial Co., Ltd. Coulomb memory element. 4,038,586, Cl. 361-435.000.
Self, Kenneth R.: *See*—
Bourgraf, Elroy E.; and Self, Kenneth R., 4,037,871, Cl. 296-20.000.
Sels, Francis Jeanne: *See*—
Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,038,075, Cl. 96-22.000.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; Sasaki, Ichiemon; and Takahashi, Kaoru, 4,038,610, Cl. 331-94.50H.
Semmelhaack, Carl Frederick; and DiVecchio, Mark Camillo, to Burroughs Corporation. Integer and floating point to binary converter. 4,038,538, Cl. 235-154.000.
Sener, Tecnica Industrial Y Naval S.A.: *See*—
Torroja, Jaime, 4,037,552, Cl. 114-74.00R.
Seperic: *See*—
Wermuth, Camille Georges; and Schwartz, Jean, 4,038,317, Cl. 260-566.0AE.
Sepso, Roger P.: *See*—
Bauer, Werner R.; and Sepso, Roger P., 4,037,317, Cl. 29-622.000.
Serur, Juan Ricardo, to International Biomedical Laboratories, Inc. Device for exchange between fluids suitable for treatment of blood. 4,038,192, Cl. 210-321.00B.
Sette, Paul R.: *See*—
Storace, Anthony; and Sette, Paul R., 4,037,675, Cl. 177-229.000.
Shabtai, Joseph; and Assaraf, Simon. Security lock for doors. 4,037,440, Cl. 70-108.000.
Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich. Rotor film column for making contact between gas and liquid. 4,038,353, Cl. 261-89.000.
Shani, Esther G. Recipe apron. 4,037,272, Cl. 2-48.000.
Shannon, Gordon Brian Roger: *See*—
Andrews, Jeremy Charles; and Shannon, Gordon Brian Roger, 4,037,538, Cl. 102-23.000.
Shapiro, Eugene: *See*—
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 4,037,445, Cl. 72-60.000.
Shattuck, Meredith David: *See*—
Champ, Robert Bruce; and Shattuck, Meredith David, 4,037,928, Cl. 350-160.00R.
Shealy, Noah Alvin, to Clark Equipment Company. Dynamic tooth clutch. 4,037,696, Cl. 192-48.500.
Shell Oil Company: *See*—
Knott, Robert F.; and Handlos, Arthur E., 4,038,156, Cl. 203-45.000.
McClure, James D.; and Brandenberger, Stanley G., 4,038,213, Cl. 252-430.000.
Snyder, John L., 4,038,237, Cl. 260-33.6AQ.
Shemano, Irving, to Richardson-Merrell Inc. Method of treating conditions of delayed hypersensitivity using bis-basic substituted acenaphthene derivatives. 4,038,400, Cl. 424-267.000.
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., to Merck & Co., Inc. Anti-inflammatory oxazole[4,5-b]pyridines. 4,038,396, Cl. 424-256.000.
Shenoy, Vittal U., to Xerox Corporation. Apparatus and method for developing an electrostatic latent image. 4,038,544, Cl. 250-315.00R.
Shibakawa, Riichiro: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.
Shibata, Hideto: *See*—
Nonaka, Urao; Shibata, Hideto; and Nakajima, Nobuyuki, 4,038,146, Cl. 195-103.50R.
Shibata, Masataka. Capo tasto. 4,037,507, Cl. 84-318.000.
Shidler, Karl Allen: *See*—
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, 4,038,693, Cl. 360-99.000.
Shimazaki, Mamoru: *See*—
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
Shindo, Minoru: *See*—
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
Shinoda, Naoharu: *See*—
Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.
Atsukawa, Masumi; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,368, Cl. 423-235.000.
Shinozaki, Nobuo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.
Shinshu Seiki Kabushiki Kaisha: *See*—
Ido, Kazuo; and Saito, Shizuo, 4,037,931, Cl. 350-160.0LC.
Shipko, Frederick J., to Coratomic Inc. Surgical tool. 4,037,277, Cl. 7-1.00G.
Shipp, Laurence Stanley John: *See*—
Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, 4,038,231, Cl. 260-29.60F.
Shirai, Masanari: *See*—
Sone, Yoshiaki; and Shirai, Masanari, 4,037,953, Cl. 355-45.000.
Shlesinger, B. Edward, Jr.; and Mariner, Charlie Dwain. Magnetic reed switch. 4,038,620, Cl. 335-153.000.
Short Brothers and Harland Limited: *See*—
Johnston, Thomas; and Youens, Frederick Peter, 4,037,807, Cl. 244-7.00B.
Showa Denko Kabushiki Kaisha: *See*—
Arakawa, Yoshiaki; Aoyanagi, Isamu; and Matsumoto, Saburo, 4,037,463, Cl. 73-341.000.
Showa Seitai Co. Ltd.: *See*—
Orikawa, Yoshizumi, 4,037,387, Cl. 53-29.000.
Shrader, Alan C., to Airco, Inc. Electron beam heating system. 4,038,484, Cl. 13-31.000.
Shuffler, Earlyn Elridge, to Vilas Industries Limited. Profile sander. 4,037,366, Cl. 51-140.000.
Shull, Harold H. Escape ladder. 4,037,686, Cl. 182-96.000.
Shultz, Jay S., to Johnson & Johnson. Aqueous resin composition containing polymers or copolymers of ethylenically unsaturated monomers and a water-soluble cationic polyelectrolyte polymer. 4,038,233, Cl. 260-29.6RW.
Shuman, Dennis A.: *See*—
Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., 4,038,480, Cl. 536-27.000.
Sidaravichus, Jonas-Donatos Bronyaus: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Sideris, Sotirios: *See*—
Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,038,689, Cl. 358-191.000.
Sieber, Paul, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for a quartz controlled electrical clock. 4,037,402, Cl. 58-85.500.
Siemens Aktiengesellschaft: *See*—
Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, 4,038,133, Cl. 176-38.000.
Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, 4,038,134, Cl. 176-65.000.
Goser, Karl, 4,038,676, Cl. 357-34.000.
Krisch, Burkhard; Veneklasen, Lee H.; and Willasch, Dieter, 4,038,543, Cl. 250-307.000.
Krueger, Hans, 4,037,927, Cl. 350-160.0LC.
Kullmann, Dieter, 4,038,492, Cl. 174-15.00S.
Wachter, Herbert; and Gronemann, Hans-Joachim, 4,038,595, Cl. 323-45.000.
Wilhelm, Manfred, 4,037,313, Cl. 29-599.000.
Siggia, Edward P., to Edward P. Siggia Inc. Vertically indexed drawer guide support strip. 4,037,897, Cl. 312-343.000.
Silec-Semi-Conducteurs: *See*—
Dumas, Guy Henri, 4,038,111, Cl. 148-188.000.
Simenc, Toni: *See*—
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.
Singer Company, The: *See*—
Brodie, Peter Michael; and Solov, Edwin George, 4,038,527, Cl. 235-150.250.
Durville, Gerard; and Wunner, Charles Hamilton, 4,037,434, Cl. 66-57.000.
Zocher, Josef, 4,037,641, Cl. 163-5.000.
Singh, Gurdial; and Von Rutte, Richard Edward, to Du Pont de Nemours, E. I., and Company. Antistatic composition containing an aliphatic polyester or polyether ester and a phosphonium salt. 4,038,258, Cl. 260-75.00T.
Sinke, Gerard C.: *See*—
May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., 4,038,188, Cl. 210-20.000.

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono. Photosensitive polymeric material and electrophotometric material and methods of manufacturing same. 4,038,468, Cl. 526-11.100.

Sirvet, Enn, to Coors Container Company. Mandrel trip mechanism for can printers. 4,037,530, Cl. 101-40.000.

Sitole, Aniel G.: *See*—
Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.

Sizova, Ljubov Sergeevna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Sjogren, Christer A.; and Backman, Ralph H., to EDS, Inc. Signature stacker employing swingable intercept means driven in a non-linear fashion. 4,037,525, Cl. 93-93.00C.

Sjoman, Carl F., to Team Industries. Method of folding and rolling briefs. 4,037,386, Cl. 53-21.0FW.

Sjostrand, Gunnar. Device in a piano mechanism. 4,037,504, Cl. 84-255.000.

Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., to Kennecott Copper Corporation. Removing ammonia from solutions of oxime-metal chelate. 4,038,298, Cl. 260-429.00J.

Skrovanek, Stephen D.: *See*—
Baumgartner, Hans R.; and Skrovanek, Stephen D., 4,038,092, Cl. 106-73.400.

Skujins, Peter: *See*—
Coyner, Robert N.; and Skujins, Peter, 4,038,239, Cl. 260-33.6UB.

Slayman, Mitchell. Golf club carrier. 4,037,765, Cl. 224-25.00R.

Slindee, Norman Edward: *See*—
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, 4,038,693, Cl. 360-99.000.

Sloan Valve Company: *See*—
Horowitz, Charles, 4,037,879, Cl. 303-23.00R.

Slomovits, Ralph. Practice cymbal cover. 4,037,509, Cl. 84-422.00R.

Small, Robert E.: *See*—
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.

Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, to Firmenich S.A. Enhancing cheese flavor in foods with a diketo-piperazine. 4,038,429, Cl. 426-537.000.

Smith, Carl Mayn; and Tiers, George V. D., to Minnesota Mining and Manufacturing Company. Silicone-compatible tris(trimethylsililyloxy)silylalkylamino-substituted quinonoid dyestuffs. 4,038,293, Cl. 260-378.000.

Smith, Donald E. Bale transporting and feeding apparatus. 4,037,741, Cl. 214-130.00C.

Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,307, Cl. 29-571.000.

Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,308, Cl. 29-571.000.

Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,309, Cl. 29-571.000.

Smith, George Elwood: *See*—
Marr, George; and Smith, George Elwood, 4,038,107, Cl. 148-1.500.

Smith International, Inc.: *See*—
Garner, Lloyd L., 4,037,300, Cl. 29-148.40R.

Smith, Kendall S., II: *See*—
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,037,896, Cl. 312-281.000.

Smith, Kenneth C., to Dayco Corporation. Textile cot assembly. 4,037,299, Cl. 29-130.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.

Smith, Malcolm John: *See*—
Randell, Donald Richard; and Smith, Malcolm John, 4,038,280, Cl. 260-293.840.

Smith, Melvin. Bicycle with shock absorbing front end. 4,037,855, Cl. 280-276.000.

Smith, Richard C.: *See*—
Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.

Smith, Warren F.: *See*—
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 4,037,445, Cl. 72-60.000.

Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., to Anderson, Clayton & Co. Margarine-like product having controlled browning properties. 4,038,436, Cl. 426-603.000.

Smyth, James A.: *See*—
Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., 4,037,940, Cl. 350-242.000.

Snam Progetti S.p.A.: *See*—
Dotti, Giuseppe, 4,037,278, Cl. 9-8.00R.
Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, 4,038,337, Cl. 260-683.200.

Snider, Hugh H., Jr.: *See*—
Briggs, George S.; and Snider, Hugh H., Jr., 4,037,517, Cl. 89-1.50D.

Snyder, John L., to Shell Oil Company. Fire retardant wire coating. 4,038,237, Cl. 260-33.6AQ.

S.p.A. Giuseppe Ratti Industria Ottica: *See*—
Blumenthal, Oreste, 4,037,946, Cl. 351-114.000.

Societe d'Etudes de Machines Thermiques: *See*—
Gallois, Jacques, 4,038,558, Cl. 290-52.000.

Societe d'Etudes et de Diffusion de Procedes et Brevets S.A.: *See*—
Casanovas, Lorenzo Puig; and Vellas, Jean Leon Justin, 4,038,163, Cl. 204-152.000.

Societe Industrielle des Charmilles: *See*—
Sabarly, Louis J., 4,037,784, Cl. 236-56.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bougain, Georges, 4,037,404, Cl. 60-223.000.
Germain, Roger Louis Elysee, 4,037,887, Cl. 308-72.000.
Legrand, Paul Joseph, 4,037,809, Cl. 244-54.000.

Societe Nationale Industrielle Aerospatiale: *See*—
Laborie, Jean-Pierre; and Pevrol, Michel, 4,038,601, Cl. 325-23.000.

Soderberg, Eric W.: *See*—
Liner, John; and Soderberg, Eric W., 4,038,149, Cl. 195-127.000.

Soderberg, Roy E.; and Hanssen, Albert J., to International Telephone and Telegraph Corporation. Control valve. 4,037,818, Cl. 251-121.000.

Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., to Xerox Corporation. Composite print wheel. 4,037,706, Cl. 197-54.000.

Sokolin, Leonid Shlemovich: *See*—
Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors. 4,037,713, Cl. 198-725.000.

Solov, Edwin George: *See*—
Brodie, Peter Michael; and Solov, Edwin George, 4,038,527, Cl. 235-150.250.

Somers, Roger E.: *See*—
Wilhelmi, Julius B.; and Somers, Roger E., 4,037,754, Cl. 220-254.000.

Sommars, Mark F., to Caterpillar Tractor Co. Altitude compensated fuel control system. 4,037,575, Cl. 123-140.0MC.

Sommers, Hans: *See*—
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.

Sone, Yoshiaki; and Shirai, Masanari, to Canon Kabushiki Kaisha. Cassette loading apparatus. 4,037,953, Cl. 355-45.000.

Sony Corporation: *See*—
Umeda, Kenkichi; and Yamauchi, Hiroyuki, 4,038,692, Cl. 360-25.000.
Yagi, Hajime; and Tsuyuki, Tadaharu, 4,038,680, Cl. 357-44.000.

Southern Pacific Transportation Company: *See*—
Jaekle, William M., 4,037,526, Cl. 98-49.000.

Souza, Anthony J., to Woodstream Corporation. Safety release for animal trap. 4,037,350, Cl. 43-90.000.

SPA-Societe Prodotti Antibiotici S.p.A.: *See*—
Bruzzese, Tiberio; and Ferrari, Rodolfo, 4,038,382, Cl. 424-117.000.

Spahrbier, Dieter: *See*—
Lippold, Hans-Martin; and Spahrbier, Dieter, 4,038,467, Cl. 429-219.000.

Sparks, Buddy G.: *See*—
Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.

Sparks, Carl K. Delivery bicycle-trailer. 4,037,853, Cl. 280-204.000.

Speco, Inc.: *See*—
Hess, Charles W., 4,037,494, Cl. 76-101.00A.

Speizman Industries, Inc.: *See*—
Tapia, Everardo, 4,037,435, Cl. 66-142.000.

Spence-Bate, Harry Arthur Hele. Photographic film reading instrument. 4,037,926, Cl. 350-135.000.

Sperry Rand Corporation: *See*—
Baumann, Martin, 4,038,521, Cl. 235-61.50S.
Schippers, Steven J., 4,038,652, Cl. 340-347.0DD.

Spies, Jacob: *See*—
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.

Spinner, Ernest Elliott: *See*—
Miller, Lowell Donald; Hounsell, Melvin Wayne; and Spinner, Ernest Elliott, 4,038,148, Cl. 195-127.000.

Spitz, Erich: *See*—
Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl. 350-160.0LC.

Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation.

Metal salts of benzoyloxybenzoates and compositions stabilized therewith. 4,038,249, Cl. 260-45.75R.

Sprague Electric Company: *See—*
Kaliebe, Kenneth J., 4,038,587, Cl. 361-321.000.

Springer, Charles H. Apparatus for attracting and electrocuting flies. 4,037,351, Cl. 43-112.000.

Sprokel, Gerard John: *See—*
Gibson, Roy Morris; and Sprokel, Gerard John, 4,038,439, Cl. 427-38.000.

Spurrell, Robert M.: *See—*
Huenniger, Edward A.; and Spurrell, Robert M., 4,037,405, Cl. 60-229.000.

Sridhar, Ramamritham: *See—*
Bell, Malcolm Charles Evert; Eerkes, Thijs; and Sridhar, Ramamritham, 4,038,066, Cl. 75-29.000.

Stacy, Denzil W.: *See—*
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 4,038,105, Cl. 136-231.000.

Stanadyne, Inc.: *See—*
Swift, Joseph Edward, 4,037,573, Cl. 123-139.0AQ.
Swift, Joseph Edward, 4,037,574, Cl. 123-139.0AQ.

Standard Brands Incorporated: *See—*
Antrim, Richard Lee; and Harris, Donald Wayne, 4,038,481, Cl. 536-56.000.

Standard Oil Company (Indiana): *See—*
Caspari, Gunter, 4,038,197, Cl. 252-46.700.
Marchant, Kerford A., Jr.; and Fenoglio, David J., 4,038,266, Cl. 260-152.000.
Roberts, James E., Jr., 4,037,626, Cl. 138-109.000.

Stapleton, Earl Wesley; McLaughlin, Patricia Ann; and Turnbaugh, Jerry Edwin, to Tektronix, Inc. Thermal printing head. 4,037,315, Cl. 29-612.000.

Starinshak, Thomas Walter: *See—*
Eckles, William Edward; and Starinshak, Thomas Walter, 4,038,161, Cl. 204-52.00R.

Staude, Heinz; and Goesswald, Fritz, to Eulit Werk Staude & Co. KG. Cloakroom bracelet for bathing establishments and the like. 4,037,442, Cl. 70-456.00R.

Stauffer Chemical Company: *See—*
Pitt, Harold M., 4,038,284, Cl. 260-307.0FA.
Via, Francis A., 4,038,164, Cl. 204-159.150.

Stautzenberger, Adin Lee; and Wagner, Frank Stevens, to Celanese Corporation. Substituted pyrimido-[4,5-d]-pyrimidine compounds useful for repelling insects, rodents or animals from substrates. 4,038,394, Cl. 424-251.000.

Steenken, Bernhard: *See—*
Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, 4,037,759, Cl. 222-142.000.

Steffen, Vincent B. Grain drying apparatus. 4,037,527, Cl. 98-55.000.

Stehlicek, Jaroslav; and Sebenda, Jan, to Ceskoslovenska akademie ved. Method for preparation of polymers which contain N-acyllactam groups. 4,038,470, Cl. 526-29.000.

Steigerwald, Karl Heinz, to Steigerwald Strahltechnik GmbH. Process for energy beam perforation, especially electron beam perforation, of multi-layered artificial leather. 4,038,513, Cl. 219-121.0EM.

Steigerwald Strahltechnik GmbH: *See—*
Steigerwald, Karl Heinz, 4,038,513, Cl. 219-121.0EM.

Steinberg, Hans: *See—*
Krutz, Wolfgang; and Steinberg, Hans, 4,037,687, Cl. 184-6.400.

Steiner, Sheldon M.: *See—*
Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.

Steinhauser, Erwin; and Litwin, Hans. Method of producing a metallic plating. 4,038,444, Cl. 427-261.000.

Stenkvist, Sven Einar, to ASEA Aktiebolag. Means for direct current arc furnaces. 4,038,483, Cl. 13-11.000.

Stenson, Derek William; and Bissel, Dennis Ray, to Post Office, The. Cables. 4,038,489, Cl. 174-70.00R.

Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, to Institut Francais du Petrole et Institut des Corps Gras (ITERG). Process for the selective hydrogenation of polyunsaturated oils. 4,038,295, Cl. 260-409.000.

Stevens, Harold E., deceased (by Stevens, Joan, heiress), to Mill & Mix Company, Inc. Grinding mill. 4,037,797, Cl. 241-100.000.

Stevens, James E.; and Martin, Randel C. Rack structure for supporting articles. 4,037,737, Cl. 211-106.000.

Stevens, Joan, heiress: *See—*
Stevens, Harold E., deceased, 4,037,797, Cl. 241-100.000.

Stewart, Patrick H.: *See—*
Kloster, William R.; and Stewart, Patrick H., 4,037,645, Cl. 164-161.000.

Stewart, Robert C., Jr.: *See—*
Lamarine, John H.; Stewart, Robert C., Jr.; and Vine, Raymond W., 4,038,463, Cl. 429-44.000.

Stickney, George A.: *See—*
Gutteridge, Ronald J.; and Stickney, George A., 4,037,306, Cl. 29-577.000.

Stiga AB: *See—*
Lindblad, Sture, 4,037,394, Cl. 56-202.000.

Stiles, Donald Joseph: *See—*
Ku, Ta Cheng; and Stiles, Donald Joseph, 4,037,707, Cl. 197-53.000.

Stiller, Paul Franklin. Film retention device. 4,037,718, Cl. 206-53.000.

Stinnes, Wolf Walter. Centrifugal moulding. 4,038,001, Cl. 425-110.000.

Stockhaus, Klaus: *See—*
Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.

Stoll, Donald H., to General Electric Company. Method of assembling temperature responsive resistance member. 4,037,316, Cl. 29-622.000.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.

Storace, Anthony; and Sette, Paul R., to Pitney-Bowes, Inc. Leaf spring weighing scale. 4,037,675, Cl. 177-229.000.

Storm, Thomas N.: *See—*
Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.

Straitz, John F., III, to Combustion Unlimited Incorporated. Flare stack gas burner. 4,038,024, Cl. 431-202.000.

Stratoflex, Inc.: *See—*
Ide, Thomas N., 4,038,051, Cl. 55-218.000.

Street, Bonnie A. Marble track toy. 4,037,355, Cl. 46-43.000.

Strelitz, Robert A.: *See—*
Elion, Gertrude B.; and Strelitz, Robert A., 4,038,479, Cl. 536-24.000.

Streubel, Hans, to Schloemann-Siemag Aktiengesellschaft. Strand guide framework for supporting a partially solidified strand in a continuous casting installation. 4,037,647, Cl. 164-282.000.

Strickland, John C.: *See—*
Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.

Strike, Donald P., to American Home Products Corporation. Prostaglandin derivatives. 4,038,308, Cl. 260-514.00D.

Strindehag, Ove; and Wrangel, Erik, to Aktiebolaget Svenska Flaktfabriken. Humidity and heat exchanger apparatus, and method for its manufacture. 4,038,059, Cl. 55-388.000.

Stubbs, Edgar S., Jr., to Rigid-Pak Corporation. Container and closure. 4,037,748, Cl. 215-256.000.

Stummer, Franz, to Kling, Alberto. Voltage and frequency control circuit. 4,038,592, Cl. 363-165.000.

Stuttgen, Friedel: *See—*
Ippen, Jakob; and Stuttgen, Friedel, 4,037,635, Cl. 152-301.000.

Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, to Sumitomo Chemical Company, Limited. Triazine reactive dyes. 4,038,267, Cl. 260-153.000.

Sugimoto, Takao, to Kawasaki Jukogyo Kabushiki Kaisha. Coupling device used in one-way rotating drive. 4,037,431, Cl. 64-14.000.

Sugio, Akitoshi: *See—*
Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.

Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, to Taniguchi Petroleum Refining Company, Limited; and T. S. Chemical, Ltd. Varnish for printing inks and its method of preparation. 4,038,087, Cl. 106-32.000.

Sullivan, Daryl Dean: *See—*
Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.

Sulzer Brothers Limited: *See—*
Ergenc, Mehmet Sahabettin; and Mandrin, Charles, 4,038,035, Cl. 23-260.000.

Sumitomo Chemical Company, Limited: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000.
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Sumitomo Metal Industries, Ltd.: *See—*
Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.

Summa Corporation: *See—*
Miller, Robert C.; and Lemont, Harold E., 4,037,751, Cl. 220-9.00R.

Summers, Gary K.: *See—*
Reiser, Roger W.; and Summers, Gary K., 4,037,790, Cl. 239-529.000.

Sunahara, Kazuo: *See—*
Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.

Sund-Akesson Aktiebolag: *See—*
Hansson, Jan Erik Enefrid, 4,038,003, Cl. 425-137.000.

Sundberg, B. E. Ingvar, to Nordisk Kartro Aktiebolag. Wire nail. 4,037,512, Cl. 85-79.000.

Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; and Sundeen, Joseph E., 4,038,273, Cl. 260-240.00D.

Supkis, Stanley J., to Norton Company. Coated abrasive bonded with urea-formaldehyde, phenolic resin blends. 4,038,046, Cl. 51-295.000.

Suschitzky, John Louis; and Rutherford, David, to Fisons Limited. Treating iron deficiency anaemia. 4,038,413, Cl. 424-295.000.

Susekov, Sergei Mikhailovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Sutton, James Anthony: *See—*
Hill, Nigel; and Sutton, James Anthony, 4,037,419, Cl. 61-45.00D.

Suzuki, Hajime; and Miyake, Hideo, to Toyo Boseki Kabushiki Kaisha. Urethane modified acrylate resin and process for the production thereof. 4,038,257, Cl. 260-75.0NK.

Suzuki, Hideo: *See*—
Miyahara, Masahiro; and Suzuki, Hideo, 4,038,530, Cl. 235-150.530.

Svanteson, Sven Elis Ake, to Aktiebolaget Electrolux. Method of processing waste on ships and the like and arrangement for carrying out the method. 4,038,184, Cl. 210-59.000.

Svejda, Terry M. Gardening implement with offcenter balancing weight. 4,037,668, Cl. 172-371.000.

Svennberg, Stig Erick: *See*—
Hellsten, Martin Edvin; Klingberg, Anu William; and Svennberg, Stig Erick, 4,038,102, Cl. 106-316.A.

Svensson, Torbjorn: *See*—
Thorsell, Torgny; and Svensson, Torbjorn, 4,037,537, Cl. 102-22.00R.

Swanholm, Carl E.; and Caldwell, Robert G., to Bio-Degradable Plastics, Inc. Photodegradable polyolefins containing an aromatic ketone, ferric stearate, and a pigment. 4,038,227, Cl. 260-23.00H.

Swanson, Eric R., to United States of America, Navy. Self learning monitor for VLF wave propagation. 4,038,529, Cl. 235-150.270.

Swift & Company: *See*—
Davies, Donald L., 4,038,424, Cl. 426-94.000.

Swift, Joseph Edward, to Stanadyne, Inc. Timing control for fuel injection pump. 4,037,573, Cl. 123-139.0AQ.

Swift, Joseph Edward, to Stanadyne, Inc. Timing control for fuel injection pump. 4,037,574, Cl. 123-139.0AQ.

Sykes, Malcolm B.: *See*—
Iten, Clemens A.; and Sykes, Malcolm B., 4,037,321, Cl. 30-47.000.

Syntex (U.S.A.) Inc.: *See*—
Nelson, Peter H.; and Untch, Karl G., 4,038,299, Cl. 260-410.500.
Walker, Keith A. M.; and Marx, Michael, 4,038,409, Cl. 424-273.000.

Systron Donner Corporation: *See*—
Hanson, Richard A., 4,037,944, Cl. 350-310.000.

Szabo, Zoltan: *See*—
Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, 4,037,413, Cl. 60-655.000.

Szalvay, Laszlo: *See*—
Ambruoso, Pasquale, Sr.; and Szalvay, Laszlo, 4,038,502, Cl. 179-179.000.

T. S. Chemical, Ltd.: *See*—
Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, 4,038,087, Cl. 106-32.000.

Tai, Wen Ten, to Nalco Chemical Company. Ionenes. 4,038,318, Cl. 260-567.60P.

Taihou Kogyo Kabushiki Kaisha: *See*—
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Takahashi, Kaoru: *See*—
Nishizawa, Jun-ichi; Sasaki, Ichiemon; and Takahashi, Kaoru, 4,038,610, Cl. 331-94.50H.

Takahashi, Naoyuki: *See*—
Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.

Takahashi, Reijiro: *See*—
Ito, Tosikatu; and Takahashi, Reijiro, 4,037,651, Cl. 165-30.000.

Takahashi, Shigeyuki: *See*—
Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,038,449, Cl. 428-220.000.

Takahashi, Tatsuo, to RCA Corporation. Certain alkali metal-rare earth metaphosphate photoluminescent glasses. 4,038,203, Cl. 252-301.40P.

Takaishi, Naotake: *See*—
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY.

Takaku, Sakae: *See*—
Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.

Takaoka, Hikaru: *See*—
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Takashima, Masaru, to Aikoh Co., Ltd. Heat-insulating agent for molten metal. 4,038,069, Cl. 75-96.000.

Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, to Kansai Paint Company, Ltd. Thermosetting high solid coating composition. 4,038,225, Cl. 260-21.000.

Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, to Kawaken Fine Chemicals Co., Ltd. Compounds of allantoin with basic amino acids. 4,038,287, Cl. 260-309.700.

Takazawa, Yuzuru: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.

Takeda Chemical Industries, Ltd.: *See*—
Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, 4,038,304, Cl. 260-468.00E.

Takeda, Yasutsugu; and Tsunoda, Yoshito, to Hitachi, Ltd. Holographic device with divided object beams, a multicolor light source and direction-selective screen. 4,037,919, Cl. 350-3.500.

Takeuchi, Hidemaro, to Nippon Steel Corporation. Carbon-free casting powder for ingot casting and continuous casting. 4,038,067, Cl. 75-257.000.

Takeuchi, Masato: *See*—
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,038,060, Cl. 62-36.000.

Takimoto, Yasuyuki: *See*—
Sakurai, Kiyomi; and Takimoto, Yasuyuki, 4,038,078, Cl. 96-35.100.

Talbert, Norwood K., to Agway, Inc. Process of dewatering sewage sludge. 4,038,180, Cl. 210-10.000.

Talbert, Norwood K., to Agway, Inc. Process for dewatering sewage sludge. 4,038,181, Cl. 210-10.000.

Talley-Frac Corporation: *See*—
Asaoka, Leo K., 4,038,112, Cl. 149-2.000.

Talucci, Anthony. Building evacuation system. 4,037,685, Cl. 182-18.000.

Tanaka, Michio: *See*—
Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, 4,038,304, Cl. 260-468.00E.

Tanaka, Susumu: *See*—
Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.

Taniguchi Petroleum Refining Company, Limited: *See*—
Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, 4,038,087, Cl. 106-32.000.

Tapia, Everardo, to Speizman Industries, Inc. Auxiliary feed attachment for a circular knitting machine. 4,037,435, Cl. 66-142.000.

Tarchalski, Edward; and Wilkinson, John C., to Heinemann Electric Company. Protective arrangement for dependent switching circuits. 4,038,584, Cl. 361-104.000.

Tarmann, Rainer; and Hopf, Walter, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Process for casting steel ingots under a vacuum. 4,037,644, Cl. 164-61.000.

Tate, George W., Jr., to Clegg, Giles C., Jr.; and Lynn, John R. Surgical mask with vapor barrier. 4,037,593, Cl. 128-146.200.

Taylor, David W., to General Motors Corporation. Anti-lock brake control circuit. 4,037,882, Cl. 303-107.000.

Taylor, George R.: *See*—
Taylor, Miller; Taylor, Jimmy N.; Taylor, Oren M.; and Taylor, George R., 4,037,392, Cl. 56-27.500.

Taylor, Jimmy N.: *See*—
Taylor, Miller; Taylor, Jimmy N.; Taylor, Oren M.; and Taylor, George R., 4,037,392, Cl. 56-27.500.

Taylor, Lynn J., to Owens-Illinois, Inc. Degradable plastic composition containing a transition metal salt of a highly unsaturated organic acid. 4,038,228, Cl. 260-23.0AC.

Taylor, Miller; Taylor, Jimmy N.; Taylor, Oren M.; and Taylor, George R. Tobacco harvester. 4,037,392, Cl. 56-27.500.

Taylor, Oren M.: *See*—
Taylor, Miller; Taylor, Jimmy N.; Taylor, Oren M.; and Taylor, George R., 4,037,392, Cl. 56-27.500.

Taylor, Peter John, to Plessey Company Limited, The. Fluid-flow assisting devices. 4,037,991, Cl. 417-80.000.

Team Industries: *See*—
Sjoman, Carl F., 4,037,386, Cl. 53-21.0FW.

Tee-pak, Inc.: *See*—
Rahman, Matiur; and Coleman, Harold R., 4,038,438, Cl. 427-385.00R.

Teissier, Jean: *See*—
Mendy, Francois; Delage, Michel; and Teissier, Jean, 4,038,421, Cl. 426-72.000.

Tektronix, Inc.: *See*—
Stapleton, Earl Wesley; McLaughlin, Patricia Ann; and Turnbaugh, Jerry Edwin, 4,037,315, Cl. 29-612.000.

Teledyne McCormick Selph: *See*—
Thatcher, Donald N.; and Arikawa, Yoshiyuki, 4,038,321, Cl. 260-583.00B.

Teller, Joseph D.; and Kelly, Kristine M., to Worthington Biochemical Corporation. Limulus lysate turbidity test for pyrogens. 4,038,029, Cl. 23-230.00B.

Tennant Company: *See*—
Dojan, Harold D., 4,037,289, Cl. 15-320.000.

Tenneco Chemicals, Inc.: *See*—
Di Bella, Eugene P., 4,038,071, Cl. 75-108.000.

Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, to Nippon Carbide Kogyo Kabushiki Kaisha. Automatic tapping machine. 4,037,828, Cl. 266-271.000.

Terada, Yoshimi; and Fujii, Akira, to Ishikawajima-Harima Jukogyo Kubushiki Kaisha. Clamping device for use in lifting ship's hull blocks or the like. 4,037,869, Cl. 294-104.000.

Terao, Alfred Y.: *See*—
Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., 4,038,505, Cl. 200-51.100.

Terao, Hisashige: *See*—
Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Tesco Engineering Company: *See*—
Miller, Sheldon M., 4,037,902, Cl. 339-49.00R.

Texaco Development Corporation: *See*—
Gipson, Robert Malone, 4,038,290, Cl. 260-348.50L.
Gipson, Robert Malone, 4,038,291, Cl. 260-348.50L.
Gipson, Robert Malone, 4,038,292, Cl. 260-348.50L.

Texaco Inc.: *See*—
Brockington, James W.; and Bennett, Richard H., 4,038,212, Cl. 252-436.000.
Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.
Duranleau, Roger G.; and Larkin, John M., 4,038,316, Cl. 260-566.00A.
Knifton, John F., 4,038,208, Cl. 252-412.000.
Potter, Clyde E.; and Richter, George N., 4,038,186, Cl. 210-92.000.

Texas Instruments Incorporated: *See—*
Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.
Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, 4,038,678, Cl. 357-81.000.
Jones, Derick; and Lu, Sun, 4,038,199, Cl. 252-299.000.
Jones, Derick; and Lu, Sun, 4,038,200, Cl. 252-299.000.
Textron, Inc.: *See—*
Peterson, William J., 4,037,771, Cl. 227-130.000.
Th.Kieserlin & Albrecht: *See—*
Fangmeier, Ralf, 4,037,446, Cl. 72-68.000.
Thaeter, Hans; and Broehl, Anton. Steam-driven tow line winch. 4,037,823, Cl. 254-172.000.
Thatcher, Donald N.; and Arikawa, Yoshiyuki, to Teledyne McCormick Selph. Process for production of unsymmetrical dimethylhydrazine by nitrosation of dimethylamine and hydrogenation of the nitroso dimethylamine to the distillation of unsymmetrical dimethylhydrazine. 4,038,321, Cl. 260-583.00B.
Thaw, Charles H.: *See—*
Karassik, Igor J.; and Thaw, Charles H., 4,037,985, Cl. 415-175.000.
Thiele, Horst. Suspension arrangement. 4,037,860, Cl. 280-709.000.
Thomas, Donald E.: *See—*
Ginex, Michael F.; and Thomas, Donald E., 4,037,510, Cl. 84-453.000.
Thomas, Earl M.. *See—*
Chow, Sen-Te; and Thomas, Earl M., 4,038,688, Cl. 358-174.000.
Thomas, Idris Lewis: *See—*
Monks, Reginald; and Thomas, Idris Lewis, 4,038,033, Cl. 23-230.300.
Thomas, Leslie D., to Westinghouse Electric Corporation. Power control on satellite uplinks. 4,038,600, Cl. 325-4.000.
Thomas, Thomas R.: *See—*
Winston, Steven J.; and Thomas, Thomas R., 4,038,369, Cl. 423-240.000.
Thompson, Arthur D.: *See—*
Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.
Thompson, Harold Godfred, to American Cyanamid Company. Method for adhesion of rubber [using N-(substituted oxymethyl)-melamines and beta naphthol] to reinforcing materials. 4,038,220, Cl. 260-3.000.
Thompson, Lloyd E., Jr. High current density electrical contact. 4,037,916, Cl. 339-258.00R.
Thompson, Thomas D., to Yara Engineering Corporation. Reactive pigments and methods of producing the same. 4,038,101, Cl. 106-308.00N.
Thomson-Brandt: *See—*
Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl. 350-160.0LC.
Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.
Thomson-CSF: *See—*
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Thomson, George A.: *See—*
Dison, James R.; and Thomson, George A., 4,038,189, Cl. 210-90.000.
Thorp, Peter; and Bycroft, George William, to Coal Industry (Patents) Limited. Flexible ducting joints. 4,037,862, Cl. 285-260.000.
Thorpe, Laurence Joseph; and Nicholson, Burnard Eugene, to RCA Corporation. Television synchronizing generator. 4,038,683, Cl. 358-19.000.
Thorsell, Torgny; and Svensson, Torbjorn, to Linden-Alimak AB. Method and a device for blasting. 4,037,537, Cl. 102-22.00R.
Thrower, Herbert T., Jr. Lapping composition containing a carboxy vinyl polymer. 4,038,048, Cl. 51-298.00R.
Thumm, Herbert H., to Mechanex Corporation, The. Lubricant seal. 4,037,849, Cl. 277-37.000.
Thumm, Herbert H.: *See—*
Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., 4,037,848, Cl. 277-37.000.
Thyssen Industrie Aktiengesellschaft: *See—*
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Tibay, Eulogio Camacho. Ribbon spool with built-in bifacial re-inker. 4,037,709, Cl. 197-171.000.
Tiers, George V. D.: *See—*
Smith, Carl Mayn; and Tiers, George V. D., 4,038,293, Cl. 260-378.000.
Timms, Donny Lee: *See—*
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Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
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Tobin, John H., to Olin Corporation. Catalytic process for preparation of perfluoroalkyl substituted aromatic compounds. 4,038,331, Cl. 260-651.00F.
Tobkes, Martin, to American Cyanamid Company. Isolation and recovery of calcium chloride complex of 7-dimethylamino-6-dimethyl l-6-deoxytetracycline hydrochloride. 4,038,315, Cl. 260-559.0AT.
Todisco, Joseph G.: *See—*
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Tokimoto, Tadashi; and Hiraishi, Yoshinobu, to Komatsu Electronic Metals Co., Ltd. Method of producing high-purity transparent vitreous silica. 4,038,370, Cl. 423-336.000.
Tokisono, Takenosuke: *See—*
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Tokuyasu, Kiyochika; Yokobori, Takeshi; and Nakahara, Chizuko, to Seikagaku Kogyo Co. Ltd. Methods for extracting and purifying kallidinogenase. 4,038,141, Cl. 195-66.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
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Toll Cryogenics, Inc.: *See—*
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Toll, Hans Robert: *See—*
Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, 4,037,368, Cl. 51-314.000.
Tolson, James William: *See—*
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Tomlinson, Ian, to Ernest Scragg & Sons Limited. Spinneret apparatus with particulate material conveying means. 4,038,013, Cl. 425-378.00S.
Tomlinson Industries, Inc.: *See—*
Chernak, John A., 4,037,817, Cl. 251-7.000.
Tomono, Hiroshi: *See—*
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Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., to General Electric Company. Magnetic inductively-coupled connector. 4,038,625, Cl. 336-83.000.
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Torres, Peter L. Water heating system including recycle loop. 4,037,567, Cl. 122-20.00B.
Torroja, Jaime, to Sener, Tecnica Industrial Y Naval S.A. Process for reducing the stresses caused by the vertical bending of a boat on independent tanks installed therein. 4,037,552, Cl. 114-74.00R.
Toth, Arpad: *See—*
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Toull, William Herbert, to E M I Limited. Apparatus for the manufacture of disc records. 4,038,009, Cl. 425-308.000.
Towle, Jack Lewis; and Vander Ploeg, John Herman, to Chemetron Corporation. Method and composition for solventless printing. 4,038,226, Cl. 260-22.0CQ.
Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Hakka Kobyo Kabushiki Kaisha: *See—*
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Toyobo Co., Ltd.: *See—*
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Traxler, James T.; Lira, Emil Patrick; and Kraemer, John F., to International Minerals & Chemical Corporation. Modified clay paper coating. 4,038,097, Cl. 106-288.00B.
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Trifiletti, Thomas, to Friese, Lucia F.; Krauss, Mary A.; and Trifiletti, Lewis, part interest to each. Screen device for stove ovens. 4,037,581, Cl. 126-39.00M.
Tringali, Richard C.: *See—*
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Trizno, Valentina Vladimirovna: *See—*
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Trompeter Electronics, Inc.: *See—*
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Trompeter, Emanuel; Hunter, Tracy A.; and Azelton, Claud, to Trompeter Electronics, Inc. Coaxial cable connector with energy loss prevention. 4,037,909, Cl. 339-177.00R.
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Turcotte, Raymond; and Quevillon, Marc, to Institut Armand Frappier. Isolation and characterization of phenotypes of mycobacteria. 4,038,142, Cl. 195-96.000.
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Tyler, Derek E.; Dickinson, David W.; and Dore, James E., to Olin Corporation. Method of melting copper alloys with a flux. 4,038,068, Cl. 75-76.000.
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Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, to Daicel, Ltd. Polypropylene or polymethylpentene film coated with graft undercoat mixture and vinylidene chloride copolymer top coating. 4,038,449, Cl. 428-220.000.
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Colli, Albert J., 4,038,372, Cl. 423-413.000.
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Miller, Gerald K.; and Lum, Sam, 4,038,490, Cl. 174-88.00C.
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Urban, Frank J., to Pfizer Inc. 3-(Heterocyclicthiomethyl) quinoxaline-1,4-dioxides. 4,038,392, Cl. 424-250.000.
Urban, Guy K., deceased (by Urban, Mary, administratrix/executrix), to Feedmobile, Inc. Portable hammermill and attached inclined augered feed table. 4,037,799, Cl. 241-186.00A.
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Vernaleken, Hugo; and Hucks, Uwe, to Bayer Aktiengesellschaft. Phase boundary process for the preparation of aromatic polycarbonates using a chlorinated aromatic hydrocarbon as the polymer solvent. 4,038,252, Cl. 260-47.0XA.
Via, Francis A., to Stauffer Chemical Company. Photopolymerizable aryl and heterocyclic glyoxylate compositions and process. 4,038,164, Cl. 204-159.150.
Victor Electric Wire & Cable Corporation: *See—*
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Vorachek, James H.; and Washall, Thomas A., to Atlantic Richfield Company. Process for the recovery of selenium from selenium-containing urethane solutions. 4,038,375, Cl. 423-510.000.

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Votocek, Otakar, to Reactor Centrum Nederland (Stichting). Process for elution of actinide metal microspheres. 4,038,202, Cl. 252-301.10S.

W. E. Bassett Company, The: *See*—
Motzer, Alfred E., 4,037,443, Cl. 70-459.000.

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Wachtel, Anselm, to Westinghouse Electric Corporation. Alkaline-earth metal halophosphate luminescent composition activated by divalent europium and method of preparing same. 4,038,204, Cl. 252-301.40P.

Wachter, Herbert; and Gronemann, Hans-Joachim, to Siemens Aktiengesellschaft. Self-exited high-frequency generator. 4,038,595, Cl. 323-45.000.

Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic fusing apparatus. 4,038,026, Cl. 432-60.000.

Wada, Shozo: *See*—
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Wagner, Christoph, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v. Manual dexterity aptitude testing. 4,037,480, Cl. 73-432.00R.

Wagner Electric Corporation: *See*—
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Wagner, Frank Stevens: *See*—
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Wagner, Kuno; and Andres, Karlheinz, to Bayer Aktiengesellschaft. Storage stable multicomponent mixtures useful in making aminoplasts, phenoplasts, and polyurethanes. 4,038,198, Cl. 252-182.000.

Wahl, Harold F.; and Keating, James L., to Rader Companies, Inc. Disk separator. 4,037,723, Cl. 209-104.000.

Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Method and apparatus for producing cigarettes with dense ends. 4,037,608, Cl. 131-21.00B.

Wahlquist, Carl D., to Building Components Research, Inc. Portable room construction and method. 4,037,385, Cl. 52-745.000.

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Walker-Arnott, David A., to Xerox Corporation. Multicolor ink ribbon control for a typewriter. 4,037,708, Cl. 197-151.000.

Walker, Derek; and Chapman, Philip Howard, to Glaxo Laboratories Limited. Aqueous insoluble polymers containing a plurality of diazomethylene groups. 4,038,469, Cl. 526-19.000.

Walker, Keith A. M.; and Marx, Michael, to Syntex (U.S.A.) Inc. 1-Phenethylimidazoles. 4,038,409, Cl. 424-273.000.

Walker-Neer Manufacturing Co., Inc.: *See*—
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Wallace-Atkins Oil Corporation: *See*—
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Wallace, Sydney Johnstone, to American Can Company. Shutter and system employing same. 4,037,329, Cl. 34-4.000.

Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., to Eco-Control, Inc. Halogen complexing ethers. 4,038,460, Cl. 429-15.000.

Walsh, Fraser M.: *See*—
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Wampetich, Matthias Johann, to Inventa AG fur Forschung und Patentverwertung. Process for improving the adhesion of poly-1,3,4-oxadiazole filaments to rubber. 4,038,455, Cl. 428-378.000.

Wanger, Robert P.: *See*—
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Warner, Harlow L.: *See*—
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Warnock, Don R., to United States of America, Air Force. Electrochemical cell having balanced distribution of oxygen and electrolyte. 4,038,461, Cl. 429-21.000.

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Washall, Thomas A.: *See*—
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Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments for cosmetic or dentrifice use and methods for their production. 4,038,098, Cl. 106-288.00B.

Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, to Mannesmann-rohren-Werke AG. Method and an apparatus for the measuring of the wall thickness of a tube. 4,038,550, Cl. 250-358.00P.

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Webb, John G., Jr.; and Gray, Roger M., to United States of America, Air Force. Helicopter discrimination apparatus for the murine radar. 4,038,656, Cl. 343-5.0SA.

Weber, Blanche V. Hand knitting aid. 4,037,433, Cl. 66-1.00A.

Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., to Quality Measurement Systems, Inc. Linear glass scale height gage. 4,037,325, Cl. 33-125.00C.

Webster, Donald R.; and Ganssle, Eugene R., to Neotec Corporation. Optical analyzer for agricultural products. 4,037,970, Cl. 356-188.000.

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Wehrmann, Nicholas, to Ithaca Textiles, Inc. Toe construction and method for seamless hosiery products. 4,037,436, Cl. 66-186.000.

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Weisberg, Michael C.: *See*—
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Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.

Weiss, Edward Leonhardt, to Leeds & Northrup Company. Method and optical means for determining dimensional characteristics of the particle distribution in a collection of particles. 4,037,965, Cl. 356-102.000.

Weitz, Hans-Martin; and Hartig, Juergen, to BASF Aktiengesellschaft. Manufacture of butenediol diacetates. 4,038,307, Cl. 260-497.00A.

Welck, Arnold Emil, to Deere & Company. Interlock for a vehicle brake and clutch control. 4,037,695, Cl. 192-13.00R.

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Weman, Per Olof, to N.V. Klippan S.A. Car seat with slack roll-up mechanism. 4,037,873, Cl. 297-388.000.

Wenander, Bjorn, to Mediplast AB. Device for transferring blood or a similar fluid to a pipette. 4,037,464, Cl. 73-61.400.

Wendorff, Erwin R. Metallic surgical suture. 4,037,603, Cl. 128-335.500.

Werber, Gerhardt P.: *See—*
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Wermuth, Camille Georges; and Schwartz, Jean, to Seperic. O-aminoalkyl oximes. 4,038,317, Cl. 260-566.0AE.

Wertheimer, Alan Lee; and Williams, Frederick Lee, to Leeds & Northrup Company. Method and apparatus for measuring the sum of the radii of particles in a collection. 4,037,964, Cl. 356-102.000.

Western Electric Company, Inc.: *See—*
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Fuchs, Francis Joseph, Jr., 4,037,454, Cl. 72-264.000.

Westfall, Paul J. Log positioners. 4,037,502, Cl. 83-726.000.

Westinghouse Air Brake Company: *See—*
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Meyer, Jeffry R.; and Billings, John S., Jr., 4,038,486, Cl. 174-28.000.
Salemi, Nicholas A., 4,038,628, Cl. 338-318.000.
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Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, 4,037,364, Cl. 51-415.000.

Whisler, Edwin Lee: *See—*
Ahlschwede, Brian Alvin; and Whisler, Edwin Lee, 4,037,487, Cl. 74-529.000.

White, Alan David: *See—*
Feldman, Martin; and White, Alan David, 4,037,969, Cl. 356-172.000.

White, Alga L.: *See—*
White, Douglas M.; and White, Alga L., 4,037,296, Cl. 24-90.00B.

White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, to Hesston Corporation. Density control mechanism for crop baler. 4,037,528, Cl. 100-191.000.

White, Douglas M.; and White, Alga L., to Alan White Company, The. Method and article for tufting upholstery and the like, and the resulting article of manufacture. 4,037,296, Cl. 24-90.00B.

White, George Raymond: *See—*
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.

White, James A., to General Electric Company. Food temperature control cable for microwave oven. 4,038,510, Cl. 219-10.55E.

White, James F.: *See—*
Farona, Michael F.; and White, James F., 4,038,324, Cl. 260-607.0AR.

White, John R.; Krishnan, Ram M.; and Wolfe, James D., to Goodyear Tire & Rubber Company, The. Mold release agent. 4,038,088, Cl. 106-38.240.

White, Stanley A., to Rockwell International Corporation. Speech analyzer/synthesizer using recursive filters. 4,038,495, Cl. 179-1.0SA.

Whiteside, George D.; and Johnson, Bruce K., to Polaroid Corporation. Shock inhibiting arrangement for latched shutter blade mechanism. 4,038,674, Cl. 354-230.000.

Whitley, William P., Jr. Float-on boat docking and lifting assembly. 4,037,421, Cl. 61-65.000.

Whitmer, Gerald T. Safety post. 4,037,824, Cl. 256-53.000.

Whittaker, Richard E. Buffing machine pad cleaning device. 4,037,287, Cl. 15-257.00R.

Wicks, Jack W. Mechanism for installation and removal of a dock in the water. 4,037,420, Cl. 61-48.000.

Widmer, John Robert; and Gloeckler, Arthur John, to Widmer Time Recorder Co., Inc. Receipt validating bank depository. 4,038,523, Cl. 235-61.90R.

Widmer Time Recorder Co., Inc.: *See—*
Widmer, John Robert; and Gloeckler, Arthur John, 4,038,523, Cl. 235-61.90R.

Wiggins Teape Limited: *See—*
Robertson, Neil George Douglas, 4,038,445, Cl. 427-150.000.

Wightman, R. Mark: *See—*
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.

Wijn, Henricus Petrus Johannes: *See—*
Gorter, Frederik Willem; and Wijn, Henricus Petrus Johannes, 4,038,597, Cl. 324-46.000.

Wilder, Donald Lawrence: *See—*
Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.

Wilding, Gerard Edward. Apparatus for forming armature windings for commutator type dynamo/electric machines. 4,037,320, Cl. 29-733.000.

Wilhelm, Manfred, to Siemens Aktiengesellschaft. Method for the manufacture of a superconductor. 4,037,313, Cl. 29-599.000.

Wilhelm, Max, to Ciba-Geigy Corporation. Cycloalkylureido phenoxy propanolamines. 4,038,313, Cl. 260-553.00A.

Wilhelmi, Julius B.; and Somers, Roger E., to TRW Inc. Closure plug. 4,037,754, Cl. 220-254.000.

Wilkinson, Bruce L.: *See—*
Fletcher, Taylor C.; and Wilkinson, Bruce L., 4,037,974, Cl. 356-246.000.

Wilkinson, John C.: *See—*
Tarchalski, Edward; and Wilkinson, John C., 4,038,584, Cl. 361-104.000.

Willasch, Dieter: *See—*
Krisch, Burkhard; Veneklasen, Lee H.; and Willasch, Dieter, 4,038,543, Cl. 250-307.000.

Willems, Jozef Frans; and Vandenberghe, Antoon Leon, to AGFA-GEVAERT N.V. Photothermographic recording sheet. 4,038,083, Cl. 96-94.00R.

Williams, Dwight E.: *See—*
Hines, Charles E.; and Williams, Dwight E., 4,037,614, Cl. 135-5.00A.

Williams, E. Alan, to Nolex Corporation. Carton closing and sealing apparatus. 4,037,370, Cl. 53-375.000.

Williams, Frederick Lee: *See—*
Wertheimer, Alan Lee; and Williams, Frederick Lee, 4,037,964, Cl. 356-102.000.

Williams, Sam F., Jr.: *See—*
Medearis, G. P.; Williams, Sam F., Jr.; and Medearis, Morris O., 4,037,286, Cl. 15-250.050.

Williams, Tudor; and Bost, John D., to E. C. P., Inc. Method and apparatus for making continuous foam glass product. 4,038,063, Cl. 65-22.000.

Willis, Michael George: *See—*
Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, 4,038,039, Cl. 23-293.00R.

Willoughby, Arnold E.: *See—*
Baldwin, Stanley H.; and Willoughby, Arnold E., 4,038,131, Cl. 162-103.000.

Willums, Jan-Olaf, to Nor-Am Resources Technology Incorporated. Apparatus for underwater retrieval, selection and concentration of material for ocean mining. 4,037,874, Cl. 299-8.000.

Wilmsen, Hans, deceased (by Wilmsen, Joerg, heir). Apparatus for the manufacture of homogeneous, fine-pored synthetic resin foams. 4,038,037, Cl. 23-288.00R.

Wilmsen, Joerg, heir: *See—*
Wilmsen, Hans, deceased, 4,038,037, Cl. 23-288.00R.

Wilson, Arthur C., to General Electric Company. Two-step control knob operation. 4,037,490, Cl. 74-553.000.

Wimmer, Gunther W.: *See—*
Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.

Winkler, Charles L., to Westinghouse Electric Corporation. Elevator system. 4,037,688, Cl. 187-29.00R.

Winston, Steven J.; and Thomas, Thomas R., to United States of America, Energy Research and Development Administration. Method for the abatement of hydrogen chloride. 4,038,369, Cl. 423-240.000.

Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., to Olin Corporation. Method and apparatus for production of multiple gauge strip. 4,037,445, Cl. 72-60.000.

Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, to Firmenich & Cie. Flavoring agent. 4,038,435, Cl. 426-535.000.

Wirtgen, Reinhard. Machine for cutting away or peeling off road surfaces. 4,037,981, Cl. 404-91.000.

Wirth, Gallo and Company: *See—*
Saner, Kaspar, 4,037,903, Cl. 339-75.00R.

Wismer, Marco: *See—*
Bosso, Joseph F.; and Wismer, Marco, 4,038,166, Cl. 204-181.000.
Bosso, Joseph F.; and Wismer, Marco, 4,038,232, Cl. 260-29.6TA.

Witzel, Bruce E.: *See—*
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.

Wochnowski, Waldemar, to Hauni-Werke Korber & Co., KG. Method and apparatus for supplying tobacco to tobacco cutting machines. 4,037,712, Cl. 198-524.000.

Wolf, Charles-B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., to Westinghouse Electric Corporation. Self-stabilizing arc heater. 4,038,512, Cl. 219-121.00P.

Wolf, Manfred: *See*—
Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.

Wolfe, James D.: *See*—
White, John R.; Krishnan, Ram M.; and Wolfe, James D., 4,038,088, Cl. 106-38.240.

Wolford, John W. Snare drum. 4,037,508, Cl. 84-415.000.

Wolfrum, Gerhard: *See*—
Hugl, Herbert; and Wolfrum, Gerhard, 4,038,240, Cl. 260-37.00N.

Wollam, John S. Indirect reflective window. 4,037,945, Cl. 350-319.000.

Wolski, Jerome C.; and Rowe, Neal E., to Westinghouse Electric Corporation. Insulating shutter mechanism for bus bars. 4,038,585, Cl. 361-334.000.

Wood, Charles E., to UOP Inc. Fractional distillation pressure control for separation of aromatic alkylation product. 4,038,334, Cl. 260-671.00R.

Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, to Deere & Company. Stack feeding apparatus. 4,037,740, Cl. 214-83.140.

Woodstream Corporation: *See*—
Souza, Anthony J., 4,037,350, Cl. 43-90.000.

Woolfson, Martin G.; and Plath, Robert H., to United States of America, Air Force. Precision amplitude control system for a high Q torsion pendulum. 4,038,588, Cl. 318-648.000.

Worthington Biochemical Corporation: *See*—
Teller, Joseph D.; and Kelly, Kristine M., 4,038,029, Cl. 23-230.00B.

Worthington Pump, Inc.: *See*—
Karassik, Igor J.; and Thaw, Charles H., 4,037,985, Cl. 415-175.000.

Woulbroun, John M.: *See*—
Francel, Josef; King, James E.; and Woulbroun, John M., 4,038,091, Cl. 106-53.000.

Wrangel, Erik: *See*—
Strindehag, Ove; and Wrangel, Erik, 4,038,059, Cl. 55-388.000.

Wrasman, Thomas J. Method of making a valve. 4,038,358, Cl. 264-242.000.

Wreszinski, Rolf W. Method and apparatus for concentrating liquids. 4,038,129, Cl. 159-4.0CC.

Wright, David: *See*—
Hedstrom, Norman; Wright, David; and O'Toole, Jerome, 4,037,895, Cl. 312-233.000.

Wright, Donald Perry, Jr., to American Cyanamid Company. Benzotriazole ovicides and larvicides. 4,038,403, Cl. 424-269.000.

Wright, Howard N., Jr.: *See*—
Palmer, Billy W.; and Wright, Howard N., Jr., 4,038,329, Cl. 260-637.00P.

Wright, John, to Koppers Company, Inc. Roll-end spindle coupling. 4,037,430, Cl. 64-9.00R.

Wright Line Inc.: *See*—
Hedstrom, Norman; Wright, David; and O'Toole, Jerome, 4,037,895, Cl. 312-233.000.

Wunner, Charles Hamilton: *See*—
Durville, Gerard; and Wunner, Charles Hamilton, 4,037,434, Cl. 66-57.000.

Xerox Corporation: *See*—
Haas, Werner E. L.; and Dir, Gary A., 4,037,932, Cl. 350-160.0LC.
Jasinski, Stefan A., 4,038,546, Cl. 250-324.000.
Lipani, Anthony F., 4,038,076, Cl. 96-1.0SD.
Looney, John Howard, 4,037,832, Cl. 271-173.000.
Neukermans, Armand P., 4,038,665, Cl. 346-74.100.
Plaza, Mario G.; and Weisberg, Michael C., 4,037,532, Cl. 101-93.480.
Quinn, Halsey P., 4,038,593, Cl. 323-4.000.
Quinn, Halsey P.; and Levinson, Donald B., 4,038,594, Cl. 323-4.000.
Shenoy, Vittal U., 4,038,544, Cl. 250-315.00R.
Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.
Walker-Arnott, David A., 4,037,708, Cl. 197-151.000.

Yagi, Hajime; and Tsuyuki, Tadaharu, to Sony Corporation. Semiconductor integrated circuit device. 4,038,680, Cl. 357-44.000.

Yagi, Kouichi: *See*—
Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, 4,038,218, Cl. 252-542.000.

Yakhontov, Leonid Nikolaevich: *See*—
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.

Yamaga, Joji; and Jido, Morio, to Agency of Industrial Science & Technology. Method for electropneumatic conversion. 4,038,511, Cl. 219-121.00P.

Yamamoto, Nobuo: *See*—
Yoshida, Takashi; and Yamamoto, Nobuo, 4,038,082, Cl. 96-77.000.

Yamamoto, Stephen K.: *See*—
Arnold, Bruce K.; and Yamamoto, Stephen K., 4,037,904, Cl. 339-64.00R.

Yamanaka, Makoto: *See*—
Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, 4,038,218, Cl. 252-542.000.

Yamashita, Nobuo; and Imai, Toshihiro, to Olympus Optical Co., Ltd. Retrofocus-type objective for endoscopes. 4,037,938, Cl. 350-202.000.

Yamato Scale Company: *See*—
Onishi, Katsuya; and Yoshida, Katsuyoshi, 4,037,715, Cl. 198-800.000.

Yamauchi, Hiroyuki: *See*—
Umeda, Kenkichi; and Yamauchi, Hiroyuki, 4,038,692, Cl. 360-25.000.

Yanina, Anna Dmitrievna: *See*—
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.

Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, to Matsushita Electric Industrial Co., Ltd. Light deflector of acousto-optic interaction type. 4,037,933, Cl. 350-161.00W.

Yara Engineering Corporation: *See*—
Thompson, Thomas D., 4,038,101, Cl. 106-308.00N.

Yatcilla, George: *See*—
White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, 4,037,528, Cl. 100-191.000.

Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., to Zippo Manufacturing Company. Magnifying lens device. 4,037,940, Cl. 350-242.000.

Yeaple Corporation: *See*—
Yeaple, Ronald Norman, 4,038,499, Cl. 179-146.00H.

Yeaple, Ronald Norman, to Yeaple Corporation. Stereophonic pillow speaker system. 4,038,499, Cl. 179-146.00H.

Yoda, Makoto: *See*—
Inoue, Hiroshi; Yoda, Makoto; and Wada, Shozo, 4,038,477, Cl. 528-487.000.

Yokobori, Takeshi: *See*—
Tokuyasu, Kiyochika; Yokobori, Takeshi; and Nakahara, Chizuko, 4,038,141, Cl. 195-66.00R.

Yokoyama, Shinichi: *See*—
Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.

Yoneda, Kenji: *See*—
Nakajima, Yasuo; and Yoneda, Kenji, 4,038,034, Cl. 23-255.00E.

Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, to Mitsubishi Gas Chemical Company, Inc. Resin composition containing copolyphenylene ether. 4,038,343, Cl. 260-874.000.

Yoshida, Katsuyoshi: *See*—
Onishi, Katsuya; and Yoshida, Katsuyoshi, 4,037,715, Cl. 198-800.000.

Yoshida, Takashi; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Image-receiving material for color diffusion transfer comprising PVA and polymethylol compounds. 4,038,082, Cl. 96-77.000.

Yoshida, Yoshinari: *See*—
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.

Yoshida, Yuji: *See*—
Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.

Youd, James D. Key holding apparatus. 4,037,439, Cl. 70-456.00R.

Youens, Frederick Peter: *See*—
Johnston, Thomas; and Youens, Frederick Peter, 4,037,807, Cl. 244-7.00B.

Young, David W., to Howard Hall & Company. Antioxidant stabilized edible compositions. 4,038,434, Cl. 426-544.000.

Young, Peter L., to Corning Glass Works. Method of forming a thin film capacitor. 4,038,167, Cl. 204-192.00D.

Yusa, Hideo: *See*—
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,038,060, Cl. 62-36.000.

Yuyama, Kousuke: *See*—
Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, 4,037,548, Cl. 112-123.00R.

Zahedi, Karim: *See*—
Melcher, James R.; Sachar, Kenneth S.; and Zahedi, Karim, 4,038,049, Cl. 55-2.000.

Zajacek, John G.: *See*—
McCoy, John J.; and Zajacek, John G., 4,038,376, Cl. 423-510.000.

Zeeman, Joan Javits. Alphabet cube puzzle. 4,037,846, Cl. 273-157.00R.

Zenith Radio Corporation: *See*—
Chiodi, Wayne R.; and Grummon, Bryan R., 4,038,621, Cl. 335-213.000.

Zhmurin, Igor Ivanovich: *See*—
Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Ziebart, Herbert F. Water ski. 4,037,279, Cl. 9-310.00A.

Zielinski, Walter J.: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,038,423, Cl. 426-72.000.

Keyser, William L.; and Zielinski, Walter J., 4,038,422, Cl. 426-72.000.

Zippo Manufacturing Company: *See*—

Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., 4,037,940, Cl. 350-242.000.

Zocher, Josef, to Singer Company, The. Method of fabricating sewing machine needles. 4,037,641, Cl. 163-5.000.

Zofko, David Edward, to American Can Company. Double seamed container and method. 4,037,550, Cl. 113-120.00Y.

Zolotarevskaya, Alla Meerovna, administrator: *See*—

Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Zolotarevskaya, Maiya Vladimirovna, administrator: *See*—

Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Zolotarevsky, Vladimir Semenovich, deceased: *See*—

Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Zuleeg, Rainer; and Notthoff, Johannes K., to McDonnell Douglas Corporation. Symmetrical input NOR/NAND gate circuit. 4,038,563, Cl. 307-205.000.

Zyduck, Ronald L., to J. I. Case Company. Vehicle with dual braking systems. 4,037,878, Cl. 303-13.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ariga, Masao: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.

Barkalow, Clare E.: *See—*
Mosley, Kenneth C.; and Barkalow, Clare E., Re. 29,317, Cl. 35-17.000.

Canon Kabushiki Kaisha: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.

Commissariat a l'Energie Atomique: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.

Fujii, Motoharu: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.

G. D. Searle & Co.: *See—*
Jones, David A.; and Mazur, Robert H., Re. 29,324, Cl. 260-112.50R.

Hargis, Billy M., to Minnesota Mining and Manufacturing Company. Hermetic power package. Re. 29,325, Cl. 174-52.00S.

Holbrook, LeGrand K., to Medical Development Corporation. Fluid collection bottle and improvements therein. Re. 29,321, Cl. 215-309.000.

Hollister Incorporated: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.

Huston, Henry H.: *See—*
Kalata, Daniel R.; and Huston, Henry H., Re. 29,320, Cl. 206-519.000.

Johnson, Bremen I.: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.

Jones, David A.; and Mazur, Robert H., to G. D. Searle & Co. N-Substituted aspartyl peptide amides. Re. 29,324, Cl. 260-112.50R.

Kalata, Daniel R.; and Huston, Henry H., to Owens-Illinois, Inc. Nestable containers. Re. 29,320, Cl. 206-515.000.

Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, to Canon Kabushiki Kaisha. Electrophotographic copying apparatus. Re. 29,323, Cl. 355-3.00R.

Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, to Commissariat a l'Energie Atomique. Integrated magnetic head having alternate conducting and insulating layers within an open loop of two magnetic films. Re. 29,326, Cl. 360-123.000.

Lebocey Industrie: *See—*
Palencher, Jacques, Re. 29,318, Cl. 66-161.000.

Mazur, Robert H.: *See—*
Jones, David A.; and Mazur, Robert H., Re. 29,324, Cl. 260-112.50R.

Medical Development Corporation: *See—*
Holbrook, LeGrand K., Re. 29,321, Cl. 215-309.000.

Melnick, Igor: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.

Michigan Instruments, Inc.: *See—*
Mosley, Kenneth C.; and Barkalow, Clare E., Re. 29,317, Cl. 35-17.000.

Minnesota Mining and Manufacturing Company: *See—*
Hargis, Billy M., Re. 29,325, Cl. 174-52.00S.

Mosley, Kenneth C.; and Barkalow, Clare E., to Michigan Instruments, Inc. Pneumatic lung analog. Re. 29,317, Cl. 35-17.000.

Nelson, Norman A., to Teledyne Merla, div. of Teledyne, Inc. Valve and actuator assembly. Re. 29,322, Cl. 251-14.000.

Nolan, John L.: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.

Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., to Hollister Incorporated. Drainage system for incisions or wounds in the body of an animal. Re. 29,319, Cl. 128-275.000.

Owens-Illinois, Inc.: *See—*
Kalata, Daniel R.; and Huston, Henry H., Re. 29,320, Cl. 206-519.000.

Palencher, Jacques, to Lebocey Industrie. Device for the detection of excessive thread tension and thread breakage. Re. 29,318, Cl. 66-161.000.

Teledyne Merla, div. of Teledyne, Inc.: *See—*
Nelson, Norman A., Re. 29,322, Cl. 251-14.000.

Valet, Jean-Yves: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.

LIST OF PLANT PATENTEES

Carlton Rose Nurseries: *See—*
McDaniel, Gayle Kent, 4,082, Cl. 18.000.

De Witte, Willem. Rose plant—Jofitali variety. 4,083, 7-26-77, Cl. 19.000.

Kirsch, Ted T. Lily plant named Star Gazer. 4,085, 7-26-77, Cl. 68.000.

McDaniel, Gayle Kent, to Carlton Rose Nurseries. Rose plant-Melissa variety. 4,082, 7-26-77, Cl. 18.000.

Parnagian, Sam. Nectarine tree. 4,084, 7-26-77, Cl. 41.000.

LIST OF DESIGN PATENTEES

AAI Corporation: *See—*
Barr, Irwin R., 245,175, Cl. D25-21.000.
Barr, Irwin R., 245,176, Cl. D25-21.000.
Barr, Irwin R., 245,177, Cl. D25-21.000.
Barr, Irwin R., 245,178, Cl. D25-21.000.
Barr, Irwin R., 245,179, Cl. D25-21.000.
Barr, Irwin R., 245,180, Cl. D25-21.000.
Barr, Irwin R., 245,181, Cl. D25-21.000.
Barr, Irwin R., 245,182, Cl. D25-21.000.
Barr, Irwin R., 245,183, Cl. D25-21.000.

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CLASS 118

314 4,037,560
629 4,037,561

CLASS 119

5 4,037,562
4,037,563
82 4,037,565
147 4,037,566

CLASS 122

20 B 4,037,567
32 4,037,569

CLASS 123

3 4,037,568
47 A 4,037,570
52 R 4,037,571
64 4,037,572
139 AQ 4,037,573
4,037,574
140 MC 4,037,575
148 E 4,037,577
148 R 4,037,576
179 BG 4,037,578

CLASS 126

25 R 4,037,580
39 M 4,037,581
116 R 4,037,582
271 4,037,583
290 4,037,584
400 4,037,579

CLASS 128

2 A 4,037,585
2.05 G 4,037,587
2.1 B 4,037,586
11 4,037,588
20 4,037,589
24.4 4,037,590
33 4,037,591
92 EB 4,037,592
142.3 4,037,594
145.7 4,037,595
146.2 4,037,593
214 C 4,037,596
4,037,597
214 E 4,037,598
214.4 4,037,599
4,037,600
275 Re.29,319
285 4,037,601
287 4,037,602
335.5 4,037,603

350 V 4,037,604
351 4,037,605
547 4,037,606

CLASS 131

10 R 4,037,607
21 B 4,037,608
141 4,037,609
184 A 4,037,610
237 4,037,611

CLASS 132

31 R 4,037,612

CLASS 134

10 4,038,103
83 4,037,613

CLASS 135

5 A 4,037,614

CLASS 136

89 P 4,038,104
231 4,038,105

CLASS 137

1 4,037,615
99 4,037,616
118 4,037,617
266 4,037,618
492.5 4,037,619
596 4,037,620
596.13 4,037,621
597 4,037,622
599 4,037,623
615 4,037,624

CLASS 138

46 4,037,625
109 4,037,626
175 4,037,627

CLASS 139

436 4,037,628

CLASS 140

106 4,037,629

CLASS 141

1.1 4,037,630
2 4,037,631

CLASS 145

46 4,037,632

CLASS 148

1.5 4,038,106
4,038,107
9.5 4,038,108
12 F 4,038,109
187 4,038,110
188 4,038,111

CLASS 149

2 4,038,112
19.4 4,038,113
4,038,114
19.8 4,038,115
105 4,038,116

CLASS 150

33 4,037,633
36 4,037,634

CLASS 152

301 4,037,635
347 4,037,636
352 R 4,037,637
415 4,037,638

CLASS 156

2 4,038,117
71 4,038,120
143 4,038,118
157 4,038,121
163 4,038,119
210 4,038,122
240 4,038,123
248 4,038,124
280 4,038,125
290 4,038,126
353 4,038,127
355 4,038,128
473 4,038,130

CLASS 159

4 CC 4,038,129

CLASS 160

133 4,037,639
398 4,037,640

CLASS 162

103 4,038,131

CLASS 163

5 4,037,641

CLASS 164

18 4,037,642
58 4,037,643
61 4,037,644
161 4,037,645
273 R 4,037,646
282 4,037,647

CLASS 165

1 4,037,653
13 4,037,648
16 4,037,649
29 4,037,650
30 4,037,651
45 4,037,652

CLASS 166

88 4,037,654
248 4,037,655
270 4,037,656
271 4,037,657
272 4,037,658
273 4,037,659
302 4,037,660
311 4,037,661
4,037,662
314 4,037,663

CLASS 169

15 4,037,664
49 4,037,665

CLASS 171

61 4,037,666

CLASS 172

14 4,037,667
59 4,037,669
371 4,037,668
795 4,037,670

CLASS 173

2 4,037,671
157 4,037,672

CLASS 174

15 S 4,038,492
28 4,038,486
36 4,038,487
52 FP 4,038,488
52 S Re.29,325
70 R 4,038,489
88 C 4,038,490
153 R 4,038,491

CLASS 175

371 4,037,673

CLASS 176

38 4,038,132
4,038,133
65 4,038,134
68 4,038,135
78 4,038,137
81 4,038,138
87 4,038,136

CLASS 177

200 4,037,674
229 4,037,675

CLASS 178

15 4,038,493
69.1 4,038,494

CLASS 179

1 N 4,038,496
1 SA 4,038,495
4,038,503
15 AT 4,038,497
18 FC 4,038,498
146 H 4,038,499
175.1 A 4,038,500
175.3 R 4,038,501
179 4,038,502

CLASS 180

6.5 4,037,676
6.7 4,037,677
11 4,037,678
24.12 4,037,679
43 R 4,037,680
44 R 4,037,681
69 R 4,037,682
99 4,037,683

CLASS 182

2 4,037,684
18 4,037,685
96 4,037,686

CLASS 184

6.4 4,037,687

CLASS 187

29 R 4,037,688

CLASS 188

1 A 4,037,689
181 R 4,037,690

CLASS 192

3.31 4,037,691
4,037,692
3.56 4,037,693
4 A 4,037,694
13 R 4,037,695
48.5 4,037,696
91 R 4,037,697
105 CE 4,037,698
134 4,037,699

CLASS 194

1 B 4,037,700
1 L 4,037,701
93 4,037,702
97 R 4,037,703

CLASS 195

1.8 4,038,139
63 4,038,140
66 R 4,038,141
96 4,038,142
100 4,038,143
4,038,144
103.5 R 4,038,145
4,038,146
4,038,147
127 4,038,148
4,038,149
4,038,150
4,038,151

CLASS 197

1 R 4,037,704
4,037,705
53 4,037,707
54 4,037,706
151 4,037,708
171 4,037,709

CLASS 198

443 4,037,710
452 4,037,711
524 4,037,712
725 4,037,713
750 4,037,714
800 4,037,715

CLASS 200

11 DA 4,038,504
51.1 4,038,505
83 J 4,038,506
84 R 4,038,507
329 4,038,508

CLASS 201

2.5 4,038,152
27 4,038,153

CLASS 202

93 4,038,154
170 4,038,155

CLASS 203

45 4,038,156

CLASS 204

16 4,038,157
23 4,038,158
38 A 4,038,159
51 4,038,160
52 R 4,038,161
105 R 4,038,162
152 4,038,163
159.15 4,038,164
176 4,038,165
181 4,038,166
192 D 4,038,167
197 4,038,168
202 4,038,169
290 R 4,038,170
298 4,038,171

CLASS 206

38 4,037,716
45.14 4,037,717
53 4,037,718
266 4,037,719
328 4,037,720
434 4,037,721
519 Re.29,320
523 4,037,722

CLASS 208

10 4,038,172
112 4,038,173
4,038,174
144 4,038,175
180 4,038,176
216 4,038,177

CLASS 209

104 4,037,723
111.7 R 4,037,724
122 4,037,725
161 4,038,178
166 4,038,179

CLASS 210

10 4,038,180
4,038,181
20 4,038,188
23 R 4,038,182
47 4,038,183
59 4,038,184
77 4,037,338
83 4,038,185
90 4,038,189
92 4,038,186
108 4,038,187
321 B 4,038,190
4,038,191
4,038,192
400 4,038,193
436 4,038,194

CLASS 211

105.5 4,037,726
106 4,037,737
117 4,037,727
124 4,037,728
208 4,037,729

CLASS 214

1 BB 4,037,730
4,037,731
4,037,732
1.5 4,037,733
8.5 A 4,037,734
10 4,037,735
23 4,037,736
38 CC 4,037,738
4,037,739
83.14 4,037,740
130 C 4,037,741
138 R 4,037,742
140 4,037,743
514 4,037,744
521 4,037,745

CLASS 215

31 4,037,746
219 4,037,747
256 4,037,748
309 Re.29,321

CLASS 219

10.55 E 4,038,510
60 A 4,038,509
121 EM 4,038,513
121 P 4,038,511
4,038,512
126 4,038,514
131 R 4,038,515
216 4,038,516
4,038,517
218 4,038,518
301 4,038,519
521 4,038,520

CLASS 220

2.3 R 4,037,749
4 E 4,037,750
9 R 4,037,751
70 4,037,752
211 4,037,753
254 4,037,754

CLASS 221

211 4,037,755
242 4,037,756

CLASS 222

129.2 4,037,757
134 4,037,758
142 4,037,759
145 4,037,760
590 4,037,761
591 4,037,762

CLASS 224

5 V 4,037,763
6 4,037,764
25 R 4,037,765
45 AA 4,037,766

CLASS 226

7 4,037,767
43 4,037,768
190 4,037,769

CLASS 227

9 4,037,770
130 4,037,771

CLASS 228

1 R 4,037,772
122 4,037,773
183 4,037,774

CLASS 229

15 4,037,775
43 4,037,776
52 B 4,037,777
55 4,037,778

CLASS 232

31 4,037,780

CLASS 233

7 4,037,781

CLASS 235

61.12 N 4,038,524
61.5 S 4,038,521
61.7 B 4,038,522
61.9 R 4,038,523
84 4,037,782
92 CN 4,038,525
150.1 4,038,526
150.25 4,038,527
150.26 4,038,528
150.27 4,038,529
150.53 4,038,530
151 4,038,668
151.1 4,038,531
151.11 4,038,533
151.3 4,038,532
151.34 4,038,534
152 4,038,535
4,038,536
153 AM 4,038,537
154 4,038,538
156 4,038,539
181 4,038,540
194 4,038,541

CLASS 236

49 4,037,783
56 4,037,784

CLASS 237

1 A 4,037,785
8 R 4,037,779
19 4,037,786

CLASS 239

2 R 4,037,787
207 4,037,788
214.17 4,037,789
529 4,037,790
542 4,037,791

CLASS 240

92 4,038,542

CLASS 241

18 4,037,792
30 4,037,793
46.17 4,037,794
58 4,037,795
59 4,037,796
100 4,037,797
101.2 4,037,798
186 A 4,037,799
213 4,037,800
247 4,037,801

CLASS 242

47.05 4,037,802
55.18 4,037,803
68.3 4,037,804

CLASS 243

38 4,037,805

CLASS 244

3.16 4,037,806
7 B 4,037,807
53 B 4,037,808
54 4,037,809

CLASS 248

68 CB 4,037,810
162 4,037,811
218.4 4,037,812
250 4,037,813
285 4,037,815
311.1 4,037,814

CLASS 249

83 4,037,816

CLASS 250

307 4,038,543
315 A 4,038,545
315 R 4,038,544
324 4,038,546
338 4,038,547
357 4,038,548
358 P 4,038,550
423 P 4,038,549
445 T 4,038,551
462 4,038,552
517 4,038,553
572 4,038,554
573 4,038,555
575 4,038,556

CLASS 251

7 4,037,817
14 Re.29,322
121 4,037,818
306 4,037,819
310 4,037,820

CLASS 252

3 4,038,195
8.8 4,038,196
46.7 4,038,197
182 4,038,198
299 4,038,199
4,038,200
300 4,038,201
301.1 S 4,038,202
301.4 P 4,038,203
4,038,204
301.6 S 4,038,205
316 4,038,206
4,038,207
412 4,038,208
419 4,038,209
426 4,038,210
430 4,038,213
435 4,038,211
436 4,038,212
458 4,038,214
465 4,038,215
514 4,038,216
521 4,038,217
542 4,038,218

CLASS 254

93 R 4,037,821
124 4,037,822
172 4,037,823

CLASS 256

53 4,037,824

CLASS 259

4 R 4,037,825
8 4,037,826
37 4,037,827

CLASS 260

2.3 4,038,219
2.5 AH 4,038,221
3 4,038,220
8 4,038,222
9 4,038,223
15 R 4,038,224
21 4,038,225
22 CQ 4,038,226
23 AC 4,038,228
23 H 4,038,227
29.4 R 4,038,229
29.6 F 4,038,230
4,038,231
4,038,234
29.6 RW 4,038,233
29.6 TA 4,038,232
30.2 4,038,235
32.8 R 4,038,236
33.6 AQ 4,038,237
33.6 UB 4,038,238
4,038,239
37 N 4,038,240
39 P 4,038,241
39 R 4,038,242
40 R 4,038,243
42.16 4,038,244
45.7 S 4,038,245
45.75 R 4,038,248
4,038,249
45.85 B 4,038,250
45.9 NC 4,038,246
4,038,247
47 R 4,038,253
47 UA 4,038,251
47 XA 4,038,252
75 N 4,038,254
4,038,255
75 NH 4,038,256
75 NK 4,038,257
75 T 4,038,258
79.1 4,038,259
4,038,260
4,038,261
4,038,262
4,038,263
79.3 M 4,038,264
79.7 4,038,265
112.5 R Re.29,324
152 4,038,266
153 4,038,267
156 4,038,268
207 4,038,269
239.1 4,038,271
239.55 R 4,038,272
240 D 4,038,273
240 F 4,038,274
243 C 4,038,275
248 C 4,038,276
256.4 C 4,038,277
256.4 N 4,038,278
268 BQ 4,038,279
293.84 4,038,280
295 D 4,038,282
295.5 B 4,038,283

296 H 4,038,281
307 FA 4,038,284
309 4,038,285
4,038,286
309.7 4,038,287
329 S 4,038,288
347.3 4,038,289
348.5 L 4,038,290
4,038,291
4,038,292
378 4,038,293
404.5 4,038,294
409 4,038,295
410.5 4,038,299
410.6 4,038,296
413 4,038,297
429 J 4,038,298
429.7 4,038,300
437 R 4,038,301
448.2 E 4,038,302
459 A 4,038,303
468 E 4,038,304
468 K 4,038,305
479 S 4,038,306
497 A 4,038,307
514 D 4,038,308
520 A 4,038,309
539 A 4,038,310
544 C 4,038,311
551 P 4,038,312
553 A 4,038,313
556 N 4,038,314
559 AT 4,038,315
566 A 4,038,316
566 AE 4,038,317
567.6 P 4,038,318
570.7 4,038,319
578 4,038,320
583 B 4,038,321
597 R 4,038,322
607 AR 4,038,323
4,038,324
612 D 4,038,325
617 C 4,038,326
619 R 4,038,327
622 R 4,038,328
637 P 4,038,329
648 C 4,038,330
651 F 4,038,331
653 4,038,332
666 PY 4,038,333
671 R 4,038,334
672 T 4,038,335
680 E 4,038,336
683.2 4,038,337
824 EP 4,038,338
835 4,038,339
861 4,038,340
862 4,038,341
4,038,342
874 4,038,343
879 4,038,344
881 4,038,345
887 4,038,346

CLASS 261

30 4,038,347
36 A 4,038,348
41 D 4,038,349
89 4,038,353

CLASS 264

22 4,038,350
45.1 4,038,351
81 4,038,352
102 4,038,354
157 4,038,355
160 4,038,356
168 4,038,357
242 4,038,358
263 4,038,359
293 4,038,360

CLASS 266

271 4,037,828

CLASS 267

110 4,037,829

CLASS 269

21 4,037,830
306 4,037,831

CLASS 271

173 4,037,832

CLASS 272

52 4,037,833
65 4,037,834
4,037,835
99 4,037,836

CLASS 273

25 4,037,837
30 4,037,838
84 4,037,839
85 A 4,037,840
96 D 4,037,841
127 R 4,037,842
131 AB 4,037,843
136 K 4,037,844
138 A 4,037,845
157 R 4,037,846
187 B 4,037,847

CLASS 277

37 4,037,848
4,037,849

CLASS 280

11.37 H 4,037,850
79.3 4,037,851
87.04 A 4,037,852
204 4,037,853
217 4,037,854
276 4,037,855
446 B 4,037,856
478 B 4,037,857
652 4,037,858
709 4,037,860

CLASS 285

5 4,037,859
168 4,037,861
260 4,037,862
320 4,037,863
342 4,037,864

CLASS 290

1 R 4,038,557
52 4,038,558

CLASS 292

357 4,037,865

CLASS 294

1 CA 4,037,866
19 R 4,037,867
4,037,868
104 4,037,869

CLASS 296

3 4,037,870
20 4,037,871
61 4,037,564

CLASS 297

65 4,037,872
388 4,037,873

CLASS 299

8 4,037,874
31 4,037,875
43 4,037,876

CLASS 302

53 4,037,877

CLASS 303

13 4,037,878
23 R 4,037,879
82 4,037,880
106 4,037,881
107 4,037,882
116 4,037,883

CLASS 307

64 4,038,559
106 4,038,560
141 4,038,561
203 4,038,562
205 4,038,563
4,038,564
225 C 4,038,565
229 4,038,566
289 4,038,569
351 4,038,568
362 4,038,567

CLASS 308

2 R 4,037,884
3.8 4,037,885
10 4,037,886
72 4,037,887
74 4,037,888
121 4,037,889
187 4,037,890
187.1 4,037,891
194 4,037,892
205 4,037,893
227 4,037,894

CLASS 310

8.1 4,038,570
8.2 4,038,571
46 4,038,572
71 4,038,573
4,038,574
179 4,038,575

CLASS 312

233 4,037,895
281 4,037,896
343 4,037,897

CLASS 313

101 4,038,576
188 4,038,577
217 4,038,578
331 4,038,579
498 4,038,580

CLASS 315

13 ST 4,038,581
129 4,038,582

CLASS 318

174 4,038,589
562 4,038,590
578 4,038,591
648 4,038,588

CLASS 323

4 4,038,593
4,038,594
45 4,038,595

CLASS 324

20 CR 4,038,616
34 R 4,038,596
46 4,038,597
72.5 4,038,598
158 F 4,038,599
179 4,038,617

CLASS 325

4 4,038,600
23 4,038,601
125 4,038,602
182 4,038,603
363 4,038,604

CLASS 328

119 4,038,605
124 4,038,606

CLASS 330

13 4,038,607

CLASS 331

56 4,038,608
65 4,038,609
94.5 H 4,038,610
108 D 4,038,611
178 4,038,612

CLASS 333

30 R 4,038,614
72 4,038,615

CLASS 335

23 4,038,618
61 4,038,619
153 4,038,620
213 4,038,621
216 4,038,622
219 4,038,623

CLASS 336

60 4,038,624
83 4,038,625

CLASS 337

4 4,038,626
107 4,038,627
321 4,038,613

CLASS 338

318 4,038,628

CLASS 339

17 C 4,037,898
4,037,899
23 4,037,900
41 4,037,901
49 R 4,037,902
64 R 4,037,904
75 R 4,037,903
98 4,037,905
107 4,037,906
126 R 4,037,907
147 R 4,037,908
177 R 4,037,909
198 R 4,037,910
4,037,912
217 S 4,037,911
221 M 4,037,913
253 R 4,037,914
258 P 4,037,915
258 R 4,037,916
259 F 4,037,917

CLASS 340

3 E 4,038,629
7 R 4,038,630
15.5 BH 4,038,631
18 NC 4,038,632
38 L 4,038,633
52 F 4,038,634
63 4,038,635
146.1 AV 4,038,636
147 MD 4,038,637
166 R 4,038,638
173 CC 4,038,647
173 R 4,038,646
4,038,648
237 S 4,038,649
244 R 4,038,650
272 4,038,639
336 4,038,651
347 DD 4,038,652

CLASS 343

5 EM 4,038,654
5 SA 4,038,656
5 W 4,038,655
6.8 R 4,038,653
7.3 4,038,657
7.7 4,038,658
17.1 R 4,038,659
18 A 4,038,660
715 4,038,661
752 4,038,662

CLASS 346

1 4,038,663
4,038,664
74.1 4,038,665
136 4,038,666
140 R 4,038,667

CLASS 350

3.5 4,037,918
4,037,919
7 4,037,920
36 4,037,921
96 B 4,037,922
4,037,923
97 4,037,924
4,037,925
135 4,037,926
160 LC 4,037,927
4,037,929
4,037,930
4,037,931
4,037,932
160 R 4,037,928
161 W 4,037,933
175 ML 4,037,934
176 4,037,935
184 4,037,937
189 4,037,936
202 4,037,938
241 4,037,939
242 4,037,940
285 4,037,941
4,037,942
294 4,037,943
310 4,037,944
319 4,037,945

CLASS 351

114 4,037,946

CLASS 352

27 4,037,947
29 4,037,948
58 4,037,950
158 4,037,949

CLASS 353

19 4,037,951

CLASS 354

76 4,038,669
96 4,038,670
197 4,038,671
212 4,038,672
222 4,038,673
230 4,038,674
238 4,038,675

CLASS 355

3 P 4,037,952
3 R Re.29,323
45 4,037,953
50 4,037,954
54 4,037,955
77 4,037,956
91 4,037,957

CLASS 356

4 4,037,958
73 4,037,959
4,037,960
85 4,037,961
86 4,037,962
4,037,963
102 4,037,964
4,037,965
4,037,966
135 4,037,967
160 4,037,968
172 4,037,969
188 4,037,970
199 4,037,971
206 4,037,972
4,037,973
246 4,037,974

CLASS 357

34 4,038,676
44 4,038,680
51 4,038,677
81 4,038,678

CLASS 358

19 4,038,683
20 4,038,681
27 4,038,684
32 4,038,685
127 4,038,679
4,038,686
128 4,038,682
165 4,038,687
174 4,038,688
191 4,038,689
213 4,038,690

CLASS 360

2 4,038,691
25 4,038,692
99 4,038,693
105 4,038,694
123 Re.29,326

CLASS 361

96 4,038,695
104 4,038,584
230 4,038,583
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